THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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Smithsonian Institute 1 Jan 1904-d* Washington D C

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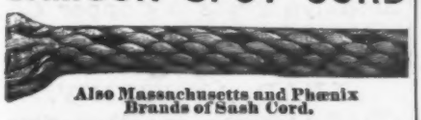

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CAHALL BOILERS See Page 122.

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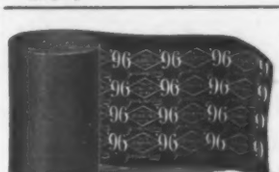

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Makes perfect joint instantly; does not have to be followed up. Makes joint that will last for years on all pressures of steam, oils, acids, &c. Does not rot, burn, blow or squeeze out. Received the highest award—**Gold Medal**—at the Pan-American Exposition.

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HOT AND COLD ROLLED STRIP STEEL.
Successor to The WILMOT & HOBBS MFG. CO.
SEE PAGE 23.

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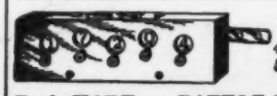
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THE IRON AGE

THURSDAY, MAY 28, 1903.

Electric Drives Applied to Bickford Radial Drills.

To meet the varying conditions which have attended the increasing demand for electrically driven machine tools the Bickford Drill & Tool Company of Cincinnati, Ohio, have applied several different styles of motor drives to their radial drills. Each of these possesses distinct advantages of its own in adapting the tool to the particular set of conditions with which it must comply. H. M. Norris, the engineer of the company and manager of the Cincinnati works, has conducted elaborate tests and experiments along the lines of ascertaining the best forms of drives, with the results herewith illustrated.

One of the neatest and most compact forms has the motor mounted on top of the column and is illustrated in Fig. 1. This design of drive employs a constant speed motor. On the particular machine represented in the engraving the motor is of about 4 horse-power. The changes of speed are accomplished by means of rapid change gearing. An extra set of gears is interposed on the head, making it possible to obtain eight changes of speed. The constant speed motor combined with the mechanical speed change device permits the variation of the speed without attending fluctuations in power. With the machine arranged in this manner many advantages are had, for by mounting the motor on top of the column the base is perfectly free, allowing for the placing of work in any position on the base. This is also an excellent arrangement when it is desired to have the machine portable, as the apparatus is entirely self contained. In moving the drill it is only necessary to break the wire con-

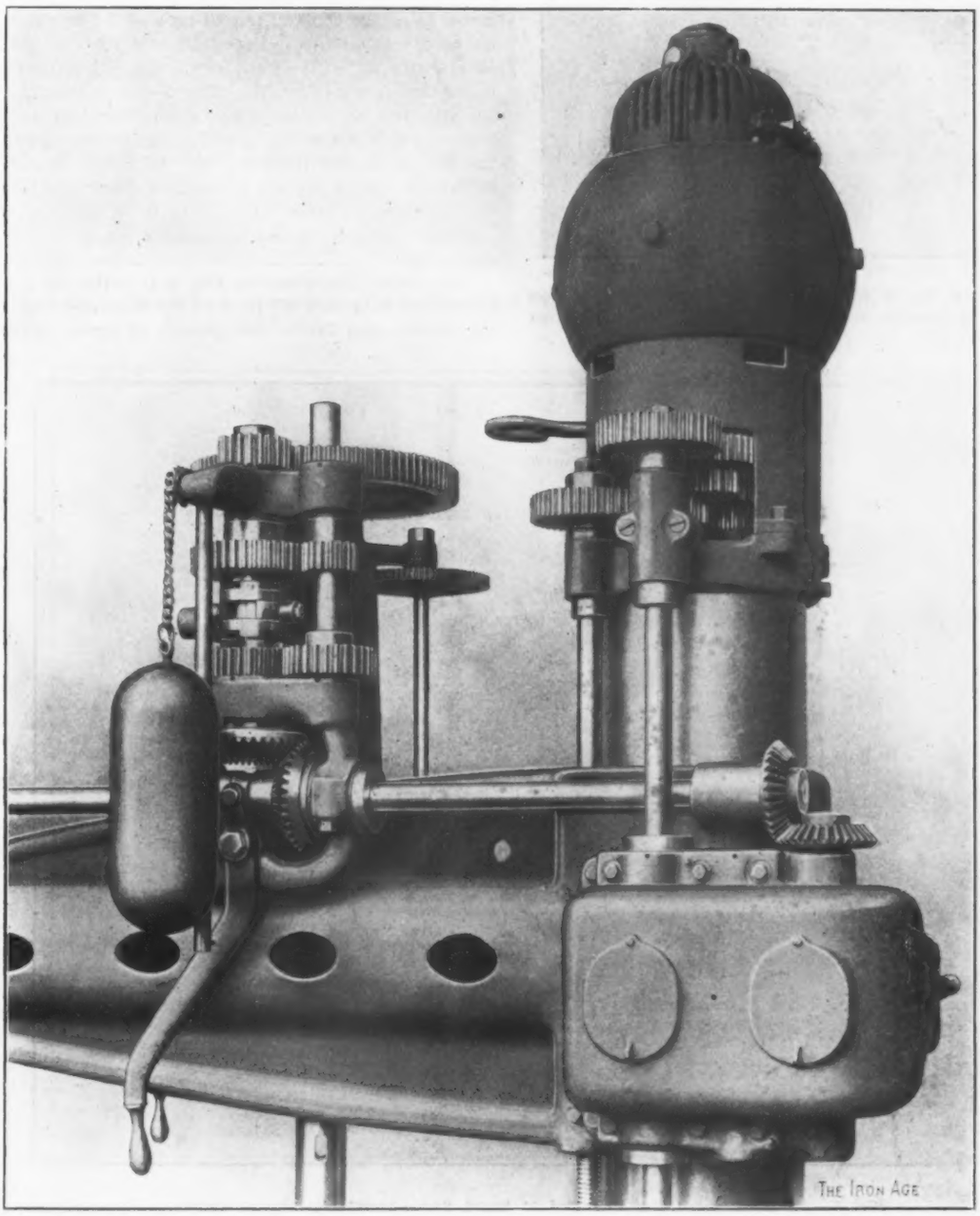


Fig. 1.—Constant Speed Motor Mounted on Column.—Eight Speeds Obtainable.

nections. As will be noted from the engraving, the motor is contained in a neat casing which excludes dirt and dust.

A No. 1 radial, fitted with a 3 horse-power variable speed Triumph motor, is shown in Fig. 2. In this type

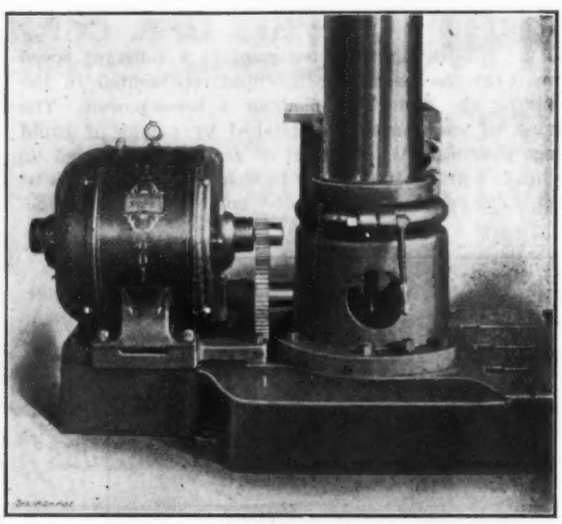


Fig. 2.—Variable Speed Motor Geared Direct.—Number of Speeds Obtainable Equal to Four Times the Number of Buttons on Speed Controller.

normal speed of the motor, while in the case of the arrangement shown in Fig. 5 the variations are obtained by working down from the normal speed of the motor, which unavoidably entails a loss of power and control.

In Fig. 3 a design is illustrated which is in more universal use than any other. This is not because it is more efficient than any of the other types, but because all of the parts except the rawhide pinion are identical for practically all makes of motors. This permits the manufacture of these parts in quantities and the standardization to an extent of radials equipped with this form of electric drive. It has also the advantage of cheapness, which, coupled with its neatness of design, wide adaptability and the promptness with which it can be supplied, makes it a most popular drive. The engraving shows its application to a No. 1 radial drill. The motor is of the constant speed type of 3 horse-power, set on an extension to the base. The changes of speed are obtained by aid of the new Bickford speed or gear box or rapid change gear system. The power is transmitted to the gear box by means of two spur gears and a rawhide pinion, which, by merely altering the number of teeth in the pinion to suit the speed of the motor it is desired to use, furnish a correct range and gradation of speeds for all sizes of drills. The lever by which the various combinations are effected in the gear box is shown in the engraving.

The drive illustrated in Fig. 4 is rather of a special nature, as it is only adapted to the type and size of motor shown, and limits the number of speed changes to

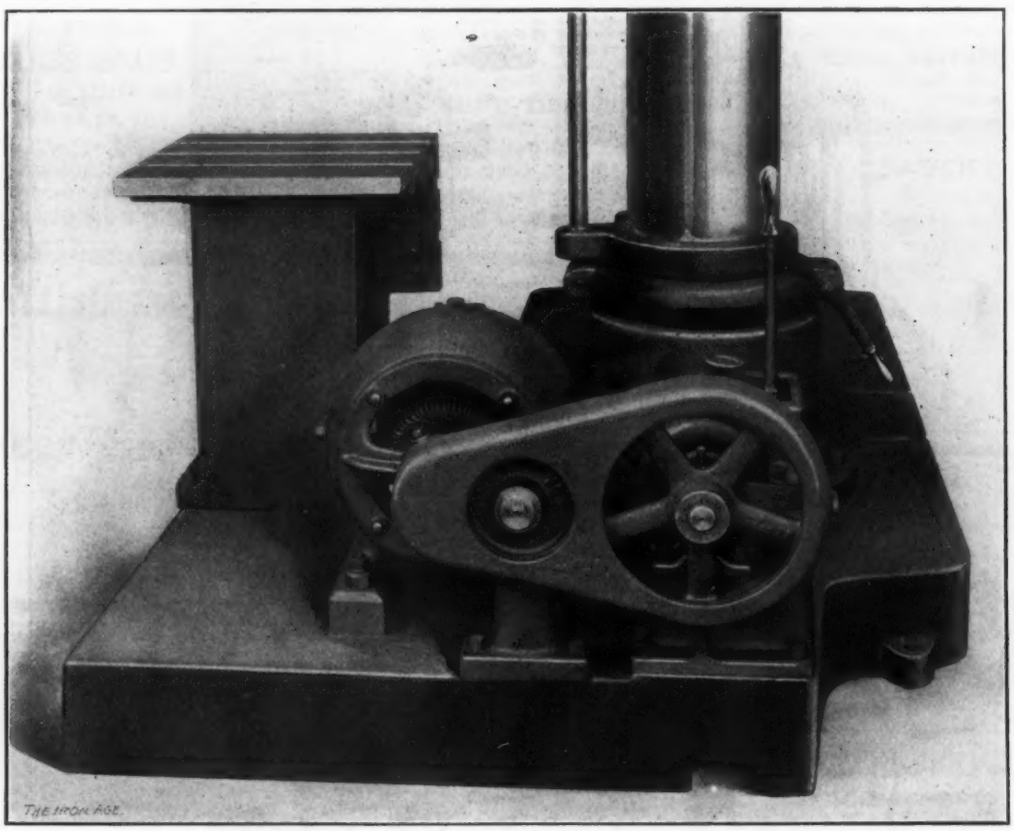


Fig. 3.—Constant Speed Motor Geared to Speed Box.—Sixteen Speeds Obtainable.

ELECTRIC DRIVES APPLIED TO BICKFORD RADIAL DRILLS.

of motor the speed changes are obtained by inserting resistance in the field circuit. The motor rests on a bracket made to fit the standard radial drill base and transmits power to the machine through a single pair of gears, which by means of a rheostat gives, with the back gears, approximately correct speeds for all sizes of drills from ½ to 3½ inches. Neither loss of power nor loss of control over the speeds is incurred by this drive, as the speed variations are obtained by working up from the eight. The engraving shows a No. 1 radial fitted with a 3 horse-power, type C, 710 revolution, Westinghouse induction motor working on a two-phase, 3000 alternation, 200 volt, circuit. The motor rests on a bracket made to fit the standard form of base and operates through a two-speed gear box, which, in conjunction with the back gears, gives instantly any one of eight speeds, ranging in geometrical progression from 46 to 176 revolutions per minute.

The arrangement shown in Fig. 5 is a No. 1 radial fitted with a 5 horse-power motor set on an extension of the base, whereby there is obtained instantly with a single voltage six times the number of speeds furnished by the back gears. This is accomplished by means of a speed

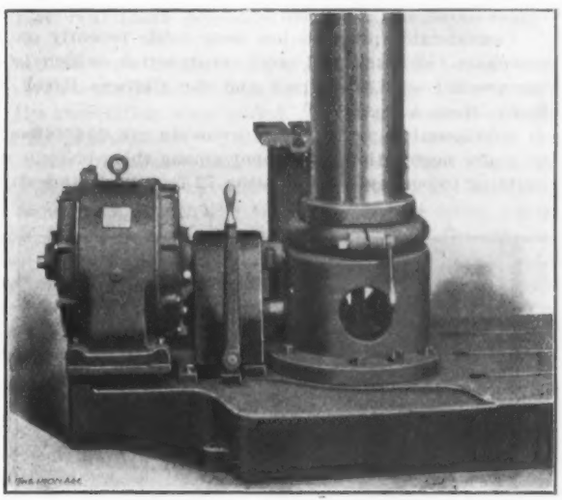


Fig. 4.—Induction Motor Direct Connected to Speed Box.—Eight Speeds Obtainable.

controller located within convenient reach of the operator. The power is transmitted by means of a silent running chain, which arrangement permits the use of almost any make of motor. While, when the controller is made to suit the back gears, this device gives a greater number of speeds than the drives employing the constant speed motor and gear box, it also possesses disadvantages. It requires a larger motor, owing to the impossibility of reducing its speed the requisite amount of 43 per cent. without effecting a corresponding reduction in power, and does not enable the operator to know at what speed he is running, since the speeds always vary with the load.

Fig. 6 shows a No. 1 Radial fitted with a 3 horse-power constant speed motor mounted on an extension to the base. The power is transmitted to a gear box where the changes of speed are obtained by a silent running chain, which, through the use of suitable sprocket wheels, furnishes, with almost any make of motor, correct speeds for all sizes of drills. The starter and cut out, it will be seen, are located immediately back of the gear box. This arrangement being entirely self contained permits the transportation of the machine to any part of the shop without necessitating any further changes than breaking the wire connections. This drive can, however, only be used in connection with motors making 1100 revolutions per minute or less.

Chicago Building Operations.

Notwithstanding the unrest in labor circles and the holding up of new contracts for buildings, there is still considerable activity in Chicago, and it may be well to call attention to the building operations now being carried on.

Most important on the list is the First National Bank Building, the first section of which is now up to the fourth story. It is probable that construction will be in process for at least a year. The estimated cost of the structure is $3,000,000.

The old buildings occupying the site of the Railway Exchange Building have been cleared away and foundations for the new building have been begun. This building will be 17 stories high, 171 x 171 feet, and cost $1,600,000. It was recently announced that the hardware contract for this building had been placed. This proves to

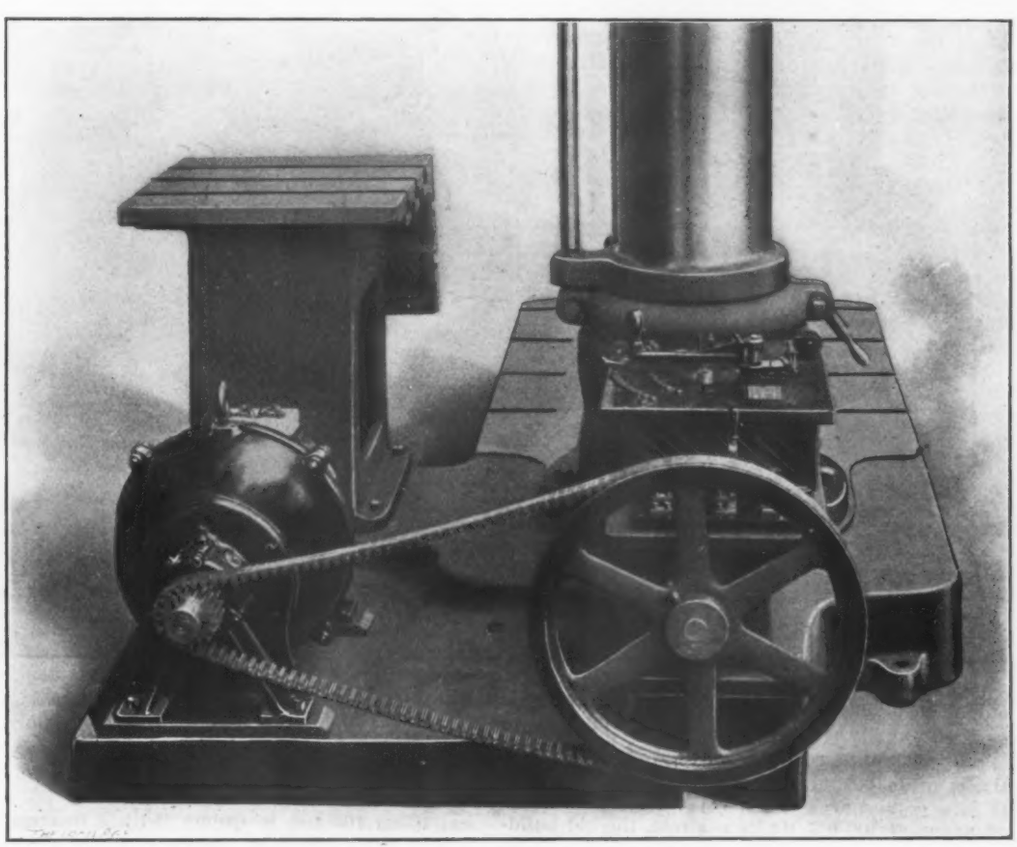


Fig. 5.—Variations Obtained by Means of Electric Controller.—Number of Speeds Equal to Four Times the Number of Buttons on Controller.

ELECTRIC DRIVES APPLIED TO BICKFORD RADIAL DRILLS.

be an error, however, it being claimed that while some contracts were taken by the general contractors that the hardware has not been placed with manufacturers.

Buildings have been removed from the lot upon which the second section of the Schlesinger & Mayer Building will be erected, in readiness for the foundation. This building will be 12 stories high, 100 feet front by 144 feet deep, and will cost $500,000.

Progress is being made in removing the old buildings from the site of the new Iroquois Theater and Iroquois office building, fronting on Randolph and Dearborn streets respectively. The office structure will be 12 stories high and the cost of the improvements is estimated at $500,000.

Preparatory to putting in the foundations for the Hartford annex at 100-102 Madison street, the old buildings are being taken down. The new structure will be 14 stories nigh, 50 x 105 feet, and will be erected at a cost of $250,000.

Preparations have been made for the construction of a new mercantile building at the southwest corner of Franklin and Congress streets, now occupied by the Butler Building, which is being torn down. The new structure will involve an expenditure of about $250,000. At the southeast corner of Franklin and Congress streets a ten-story fire proof building is being erected which is expected to be completed by January 1.

Another mercantile building, ten stories in hight, of fire proof construction, 54 x 142 feet, it is said will be erected by the Carter Estate at 335-337 Franklin street, to be completed by the first of the year.

The four-story buildings on the southeast corner of Clark and Van Buren streets are being razed to prepare the way for the new Hamilton Building, which will be five stories in hight, 100 x 100 feet. It is contemplated to further extend this building subsequently. The estimated cost of the improvements is $250,000.

Rapid progress is making in the construction of the ten-story warehouse at 121 to 129 Plymouth place, which is being erected by Charles Pope. The new building occupies an area of 100 x 100 feet.

Considerable progress has been made recently on the warehouse of brick and steel construction, which is being erected on Lake street and the Chicago River for Kelly, Maus & Co.

Additional important improvements are understood to be under negotiation, prominent among them being a new building to occupy a lot fronting 72 feet on Adams street, extending 165 feet to Quincy, with a frontage of 52 feet on the latter street, by Martin A. Ryerson. The building will have about 10,000 square feet of floor space, be constructed of pressed brick and terra cotta. The estimated cost is $180,000.

A contract has been let to the Wells Brothers Company for the construction of a ten-story building on the south side of Congress street, extending from Franklin to Market streets, with a frontage of 212 feet on Congress and 105 on Franklin. It will be of modern steel construction and will cost approximately $300,000.

It should be remembered that for most of these buildings contracts for structural steel have been let and therefore do not indicate that much additional tonnage is in sight for the manufacturers.

It is also understood that plans are being prepared for a new building to be erected by S. D. Kimbark on Wabash avenue, between Monroe and Madison streets, to be 14

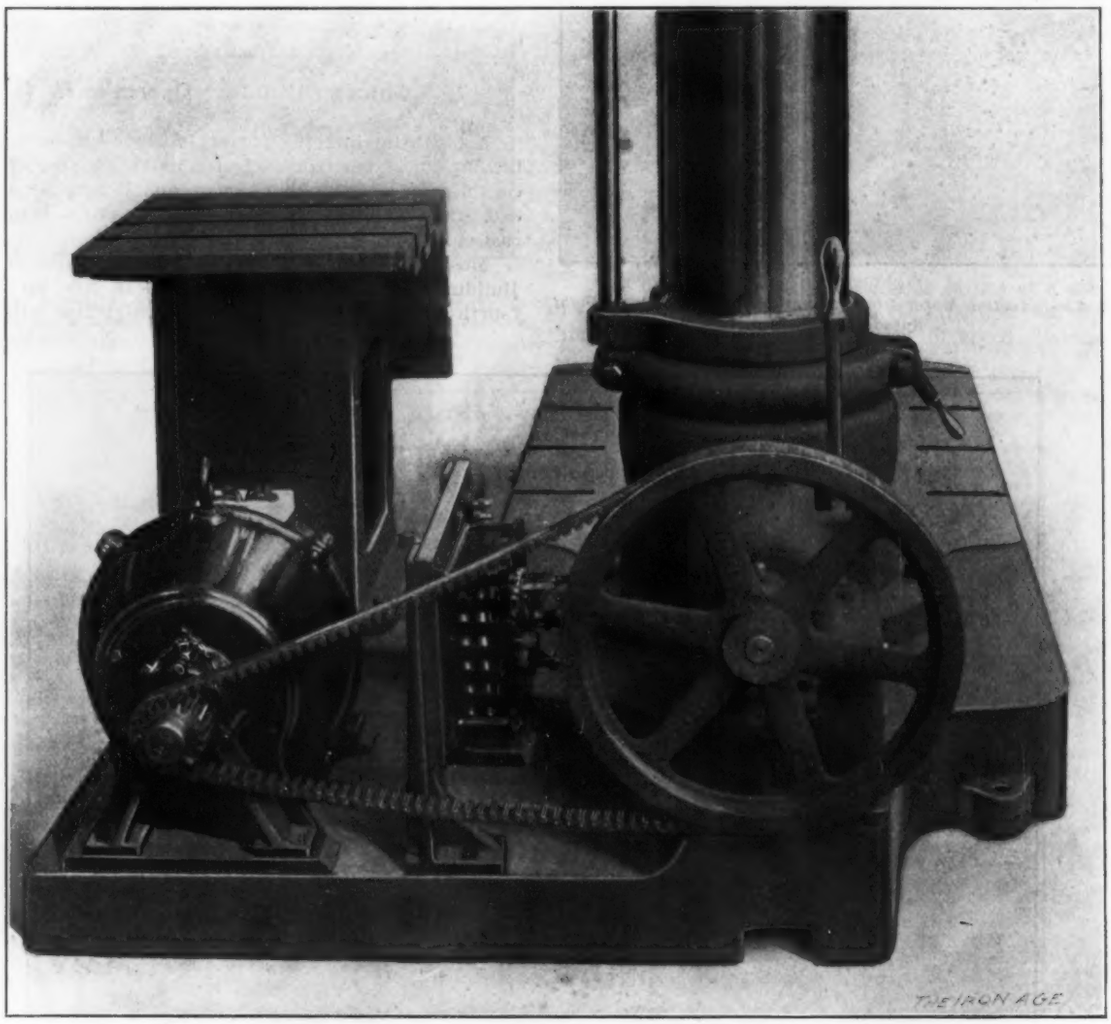


Fig. 6.—Constant Speed Motor Connected to Speed Box by Silent Chain.—Sixteen Speeds Obtainable.

ELECTRIC DRIVES APPLIED TO BICKFORD RADIAL DRILLS.

stories in hight, of brick and steel construction. It is understood that the tonnage of steel in this building will be about 500 tons.

The placing of the hardware contract for the United States Post Office and Custom House Building is reported to have been postponed another month.

The National Association of Manufacturers.

At the New Orleans convention a special committee of seven was elected, to which the president and secretary of the association were added, for the purpose of extending the organization. This special committee met in the offices of the association, 170 Broadway, New York, on May 21, and passed a resolution empowering the secretary to communicate with the employers of any trade which shall, by the request of any five members of the association engaged in any one trade, ask that such trade be specially organized into an association, and the secretary was also authorized to render any reasonable assistance in perfecting organization.

The New Orleans convention also passed a resolution authorizing the same committee to devise and put into effect practical plans for bringing about the co-operation of State associations. In accordance with this authority the committee has empowered the secretary of the association to develop sources of information enabling him to keep closely in touch with all proposed legislation affecting manufacturers, and, at his discretion, to call the attention of the association to it, if, in his judgment, the rights or interests of a member were affected.

The Executive Committee met on the following day. Of the 15 members 13 were present, the largest number ever present at a meeting of the Executive Committee of the association. Those present were: George T. Coppins, Walworth Mfg. Company, Boston; A. H. Bullard, Bullard Machine Tool Company, Bridgeport, Conn.; William McCarroll, American Leather Company, New York; E. F. Hartshorn, Stewart-Hartshorn Company, Newark, N. J.; A. B. Farquhar, A. B. Farquhar Company, York, Pa.; J. A. Jeffrey, Jeffrey Mfg. Company, Columbus, Ohio; James Inglis, American Blower Company, Detroit; H. S. Smith, Manasha Wooden Ware Company, Manasha, Wis.; C. N. Fay, Fay-Sholes Company, Chicago; J. W. Van Cleave, Buck's Stove & Range Company, St. Louis; H. S. Chamberlain, Citico Furnace Company, Chattanooga, Tenn.; David M. Parry, Parry Mfg. Company, Indianapolis; Marshall Cushing, secretary, New York. The two absent members were F. H. Stillman, Watson-Stillman Company, New York, and Charles A. Carlisle, Studebaker Bros. Mfg. Company, South Bend, Ind.

At this meeting committees were appointed to carry out some of the important measures of the organization. They named the usual Executive Committee at large, consisting of the following: George A. Draper, Draper Company, Hopedale, Mass.; Charles A. Schieren, Charles A. Schieren & Co., New York; Daniel C. Ripley, United States Glass Company, Pittsburgh; Thomas P. Egan, J. A. Fay & Egan Company, Cincinnati; F. C. Nunemacher, Louisville; Daniel A. Tompkins, D. A. Tompkins Company, Charlotte, N. C.

The Legislative Committee, which will look after legislation of particular interest to the association, comprises the following: A. D. Bellamy, Florence Wagon Works, Florence, Ala.; H. T. Scott, Union Iron Works, San Francisco, Cal.; Charles M. Jarvis, P. & F. Corbin, New Britain, Conn.; H. W. Gause, Harlan & Hollingsworth, Wilmington, Del.; Daniel Fraser, Norris Peters Company, Washington, D. C.; J. F. Hanson, Bibb Mfg. Company, Macon, Ga.; James Deering, International Harvester Company, Chicago; J. S. Ketcham, Brown-Ketcham Company, Indianapolis; James W. Porch, Lukens Iron & Steel Company, New Orleans; C. W. Post, Postum Cereal Company, Battle Creek, Mich.; W. S. Dickey, W. S. Dickey Clay Mfg. Company, Kansas City, Mo.; Benjamin H. Tatem, Bald Butte Mining Company, Helena, Mont.; E. B. Pike, Pike Mfg. Company, Pike Station, N. H.; R. C. Jenkinson, R. C. Jenkinson & Co., Newark, N. J.; Otis H. Cutler, American Brake Shoe & Foundry Company, New York; Ludwig Nissen, Ludwig Nissen & Co., New York; Joseph Kilbourne, Kilbourne & Jacobs Mfg. Company, Columbus, Ohio; Thomas Dolan, United Gas Improvement Company, Philadelphia; Theodore C. Search, Philadelphia; Henry P. Sharpe, Brown & Sharpe Mfg. Company, Providence, R. I.; James Maynard, Brookside Mills, Knoxville, Tenn.; E. T. Bull, J. I. Case Threshing Machine Company, Racine, Wis.

The following vice-presidents were elected to fill vacancies remaining after the adjournment of the New Orleans convention: California, Fred. J. Koster, San Francisco; Delaware, Charles W. Pusey, Wilmington; District of Columbia, Daniel Fraser, Washington; Iowa, F. S. Kretsinger, Fort Madison; Kansas, H. N. Strait, Kansas City; Maryland, Summerfield Baldwin, Baltimore; Minnesota, H. S. Kinney, Winona; Mississippi, F. P. Fox, Vicksburg; Montana, Benjamin H. Tatem, Helena; Virginia, Gifford V. Lewis, Richmond.

At this meeting the president was authorized to select additional legal counsel for the association, with instructions that a general plan be prepared whereby the members may defend themselves against unlawful acts of unions. While not specifically mentioned, the acts to which attention will be given in drawing up the plan of defense will be injunctions and the interference with employees. The manufacturers feel that it is absolutely necessary that they do something toward preventing unions from intimidating men who are willing to work. In their experience with strikers it has been found that few strikers and their sympathizers hesitate to interfere with law abiding men, simply because they are willing to work for wages that the strikers themselves will not accept. It will be the purpose of the legal counsel appointed to provide a method which will effectually and legally protect the interest of the members of the association.

The membership of the association has been steadily increasing. The gain in April was 132, and additions in May have brought the gain well up toward 200. The withdrawals since the New Orleans convention have numbered only two.

The Grand Trunk Transcontinental Railway.

Prominent among railway enterprises is the building of a transcontinental railway from deep water at Quebec to the Pacific Coast at a port 300 to 400 miles north of the Canadian Pacific terminus. The new line is to be known as the Grand Trunk Pacific Railway. An application for a charter has been made to the Canadian House of Commons. The first hearing of this application came before the Railway Committee on May 7. The Grand Trunk Railway appeared in advocacy of the enterprise, letting it be known that the projected line is an enterprise of the Grand Trunk Railway Company. The length of the main line, as now projected, will be about 3025 miles. North of the Canadian Pacific is a great extent of territory within the cereal growing belt calling for transportation facilities, and one of the objects of the promoters of the new transcontinental line is to develop this territory. It is also expected to benefit materially the eastern maritime provinces and those of Quebec and Ontario. The new line is further advocated by its projectors as furnishing the shortest line between Liverpool, Japan and other Oriental countries. In a statement made to the Parliamentary Committee it was shown that a line from Quebec to Yokohama is 525 miles shorter than by the Canadian Pacific; from Montreal nearly 400 miles shorter; that from Halifax to Yokohama in connection with the intercolonial the proposed route will be the shortest line by 310 miles, and from St. John to Yokohama by 260 miles; that from Liverpool to Yokohama the Grand Trunk Pacific combination by way of Halifax and Montreal will be shorter by 310 miles than by Halifax and the Canadian Pacific; also that from Liverpool by way of Montreal the proposed line will be shorter by 393 miles than by Montreal and the Canadian Pacific, and shorter by 1212 miles than via New York and Chicago. The statement is also made that it will be a shorter route than via Moscow and the Trans-Siberian Railway, while from Liverpool via Quebec the advantage over existing routes will be even greater.

According to press reports the Parliamentary Railway Committee at its session May 13 adopted the preamble to the charter, thus sanctioning the application, but without passing the succeeding clauses adjournment was taken until May 27.

Unsatisfactory Situation in Scotland.

Labor Troubles Among the Shipbuilders.

GLASGOW, May 14, 1903.—The crisis in the shipbuilding industry here, which is still in progress, is due rather to a quarrel between the local members of a trade union and their Executive Council than to a direct dispute between masters and men. In point of fact, the issue was really a revolt in the camp of the Amalgamated Society of Engineers, commonly known as the A. S. E. Not the less, but perhaps all the more, are the industrial and economic aspects of the most serious import.

Toward the end of last year the shipbuilders on the northeast coast, and at the beginning of this year those in the Clyde area, came to the conclusion that no revival of activity of shipbuilding could be expected until the cost of producing new ships was reduced. The English builders were in a more depressed condition than the Scotch, but the plight of both was the same. Everything possible was done to bring down costs by improved methods and economies in the yards, but the greatest item of cost in the production of a ship is labor, and that had to be dealt with in a comprehensive fashion. There are few employers in any trade who will not postpone as long as possible a reduction of their wage bill, for apart from consideration for the men there is always the possibility of provoking a strike.

Broadly, the reduction in labor aimed at, whether in time rates or piece rates, was 5 per cent. The North of England builders asked more, and were in difficulties with some of their men before the Scotch builders began to act. Numerous conferences took place in the two districts, with the result that one class after the other of the several workers in the shipyards consented to the reduction so as to help toward promoting a revival in business. The nonunion workmen, of course, concurred, and the acceptance of the reduction in each and all of these trades was on the understanding that the reduction would be general, and that no trade union connected with the industry should be exempted from the common arrangement.

The men in the engineering branches of the trade, however, did not concur. These include the members of the A. S. E., of the Steam Engine Makers' Society and of the Society of Machine Workers—known as the Allied Trade Unions, which fought the engineering employers in 1897 and concluded a treaty of peace with them in 1898. These workmen argued that the general state of their trade did not warrant any reduction. After numerous local conferences the matter was referred to a board consisting of the executive committees of the Employers' Federation and of the Allied Trade Unions. The board "recommended" that not all the reduction asked by the North of England employers, nor the date named by the Scotch employers, should be accepted, but that a reduction amounting to 5 per cent. be adopted in both districts, to come into force on and after May 1.

The Men Refuse to Submit.

The employers in both districts accepted, but the men in both districts rejected, though the award was practically drawn up by their own delegates. By a vote of 6500 to 2200—only a very small proportion, by the way, of the whole number concerned—they declared in favor of a strike if the employers acted on the recommendation of the board. The employers, of course, did so act and intimated at once that the new scales of pay would begin on May 1. On hearing of the adverse vote of their members the Executive Council of the A. S. E. promptly advised their men to go on working at the new rate, and said they would arrange for another conference with the employers. In the North of England the men complied at once, on the condition that a conference should be arranged immediately. But in the Clyde district, or a considerable portion of it, the A. S. E. men went on strike, in utter disregard of their executive.

The Executive Council of the society have the power to refuse strike pay to those who go on strike without their approval, and also to prevent contributions from the National Federation of Trade Unions. Such payments they at once forbade, to the great indignation of the rebels, who had been looking forward to $5 a week for doing nothing. A delicate problem in trade unionism was suddenly projected, and made all the more delicate by the fact that the re-election of an Executive Council is in progress, and that Mr. Barnes, the secretary, is to be a candidate at the next Parliamentary election for one of the Divisions of Glasgow, where the rebellion has occurred.

The industrial position is this: That the employers cannot, in honor to the other trade unions, cancel the reduction in the wages of the engineers, and they are quite pronounced in their determination not to do so. And if the A. S. E., as a society, support a strike in the shipbuilding branch a general lockout by the federated employers all over the country must sooner or later result. Of what use is collective bargaining or organized agreements with trade unions if a part is allowed to be greater than the whole? This week, however, the Clyde men have made a virtue of necessity and have agreed to drop into work at the reduced rates, pending the result of a conference arranged between the Executive Council of their society and representatives of the Employers' Federation. Whether they will go on working at the reduced rates after the conference remains to be seen, but all the other workers in the shipbuilding trade have accepted similar reductions, as have also the steam engine makers in the engineering branches. Meanwhile I learn that at a conference between the federated employers and the officials of the A. S. E., held at York yesterday, the employers, while declining to withdraw or abate the reduction, agreed to allow the question of wages to be raised again in three months' time, instead of making the arrangement binding for the usual term of six months.

The Iron Trade.

The pig iron market has, of course, been much disturbed by the dispute in the shipbuilding trade, as well as by the character of American advices. Last week there was a rapid run of heavy selling of warrants followed by a hardening, but as prices hardened transactions dwindled. Of legitimate business there was little or none until London operators, attracted by the low prices, again began to buy. This brought in a new set of bears, who speculated heavily on the strike in the shipbuilding trade coming off on an extensive scale. This week, with more appearance of a peaceful settlement of the dispute, sellers withdrew and prices recovered about 1 shilling a ton. Moreover, the receipt of an order for a small quantity (1200 tons) of Cleveland foundry iron for America (after the demand for that quality from your side was believed to be over), and some further inquiries for hematite iron, gave more strength to warrants.

At the time of writing Cleveland warrants are 46 shillings 6 pence, Scotch 52 shillings and Cumberland hematite 57 shillings 9 pence. But this week business generally is dislocated by the state visit of the King and Queen to Glasgow and its attendant ceremonies. Makers' prices have varied little. Current quotations are: Coltness No. 1, 72 shillings 6 pence; No. 3, 59 shillings 6 pence; Gartsherrie No. 1, 64 shillings; No. 3, 57 shillings 6 pence; Summerlee No. 1, 67 shillings 6 pence; No. 3, 59 shillings; Calder No. 1, 63 shillings 6 pence; Langloan No. 1, 70 shillings 6 pence; No. 3, 59 shillings 6 pence; Clyde No. 1, 63 shillings 6 pence; No. 3, 57 shillings; Carnbroe No. 1, 57 shillings 6 pence; No. 3, 55 shillings 6 pence; Monkland No. 1, 57 shillings; No. 3, 55 shillings; Govan No. 3, 55 shillings 6 pence; Eglinton No. 1, 58 shillings; No. 3, 55 shillings; Glengarnock No. 1, 64 shillings; No. 3, 57 shillings; Dalmellington No. 1, 57 shillings 6 pence; No. 3, 54 shillings 6 pence; Shotts No. 1, 66 shillings 6 pence; No. 3, 58 shillings 6 pence. Middlesbrough hematite is 57 shillings 6 pence for mixed numbers, and Scotch hematite 62 shillings, delivered to steel works. The shipments both from the Tees and from Scotch ports are keeping ahead of last year.

The shipments to foreign countries in April amounted to 93,578 tons, as compared with 72,884 tons in the corresponding month last year. The shipments to the United States in April were 34,840 tons and in the four months ending April 184,471 tons, the corresponding figures last

year being 7720 tons and 34,840 tons, respectively. All this means a large business still doing with your side. It is not confined to crude iron, for considerable orders are on hand for both crude and finished steel. I notice that we had no imports of American pig iron into this country in April, and have only had 836 tons in the four months ending April. In the first four months of 1902 we had 4907 tons and in the first four months of 1901 we had 25,311 tons. Times have changed, but next year you will probably be sending us 20,000 tons a month or more. To-day there is no market, on account of the visit of the King and Queen to this city. But yesterday the tone was flat on receipt of cables from your side reporting a further decline of $1 per ton in the prices of Northern foundry. At present rates, however, of our coal and ore costs our smelters must be doing quite well just now.

Good Finds of Iron Ore in Spain.

Scotch iron smelters get most of their iron ore from Bilbao. We learn that the former fears of the coming exhaustion of the ore there have been exaggerated. The necessities of the situation have caused further search and some good finds of ore have been found in ground that had been previously passed over as useless. Moreover, in mines which were abandoned in the good old days by the owners because they were not yielding enough, a large quatity is now being extracted by new owners and improved appliances. It is now predicted that there need be no falling off in the supply for at least a decade. Last year the exports from Bilbao were 4,196,851 tons, of which 2,996,908 tons were to Great Britain, 672,368 tons to Holland (for Germany), 57,688 tons to Germany direct, 224,570 tons to Belgium, 199,305 tons to France and 45,998 tons to the United States. The average quality, however, is not so good as it was, although the 50 per cent. guarantee is maintained, and the practice is to mix a large proportion of inferior ore with the better quality, so as to work off the poor stuff. There is a slightly higher percentage of phosphorus in the Bilbao ore than there should be.

Launch of the "Commonwealth."

An event in the Clyde this week has been the launch of the "Commonwealth," tne largest battle ship in the world, by the Fairfield Shipbuilding & Engineering Company. This vessel has been brought to the launching stage in ten months—an unprecedentedly short period for constructional work. She is one of three of the "King Edward VII" class ordered by the Admiralty last year. Her displacement is 16,350 tons, which is 1150 tons more than the largest battle ship previously afloat. The launching weight of the vessel was 8000 tons. The machinery consists of two sets of triple expansion engines, each set having four cylinders working on four cranks 33½, 54½, 63 and 63 inches, respectively, for a stroke of 4 feet. There will be an installation of 16 Babcock & Wilcox water tube boilers, designed to work at 270 pounds pressure and to develop 18,000 indicated horsepower for a speed of 18½ knots. B. T.

The Chicago Engineering & Construction Company.—The Chicago Engineering & Construction Company, with a capital of $250,000, have acquired the engineering and contracting business of Weston Brothers, Chicago, offices being located in the Merchants' Loan and Trust Building of that city. Weston Brothers are well known as the designers of the Intramural transportation system for the Louisiana Purchase Exposition at St. Louis, and as being associated with Bion J. Arnold in the preparation of the report on local transportation conditions which was made to the City Council of the city of Chicago. The officers of the new company are: Chas. B. Weston, president; George Weston, vice-president; George A. Yuille, secretary and general manager; Hervey B. Hicks, counsel, all of whom are directors, and with the addition of Addison E. Wells, Fred. A. Wells and Edward B. Burling, constitute the full board. George Yuille was formerly vice-president and general manager of the West Chicago Street Railway Company. Addison E. Wells and Fred. A. Wells are leading building contractors. H. B. Hicks has been in the engineering service of many Western railroads. Edward B. Burling is a member of the firm of Bentley & Burling, attorneys. The new company will make a specialty of the supervision and construction of electric railroads, and are now engaged in constructing an electric line from Rockford to Freeport, Ill.

Labor in New England.

The labor situation among the metal trades of New England gets less and less threatening as the days go by. The troubles of the boiler manufacturers are ended practically everywhere. There are no prospects of a machinists' strike, so far as can be learned. In Worcester, where the Machinists' Union made demand for a nine-hour day last week, no answer has been given by the employers, and nothing further is planned by the union, its members say. The great majority of the Worcester machinists have nothing but criticism for the demand.

In Providence the demand made in the middle of April by the Molders' Union for a shorter day and larger pay has gone no further than a demand. Vice-President Valentine of the national organization of molders has been in the city several times, and has talked with some of the employers of molders. He has urged that the employers organize, that their association may treat as such with the union, but of course the employers do not agree to the expediency of treating with the union as such, preferring to deal with their men as individuals. There will be no molders' strike in Providence this year, unless conditions change very greatly.

The strike of structural steel workers employed at the Builders' Foundry is ended, the men having gone back to work. The company did not grant the demands for a shorter day and 40 cents an hour. But there was a conference between some of the men and the officials of the company at which the officials stated that on looking over their pay roll it was found that some of the higher waged men were not getting as much as might reasonably be paid them, and that the company were willing to pay such men more wages. On the other hand, they were unwilling to pay other men more than they were getting. It was a case of treating the men as individuals and not as a union. The result of this was that the men, or at any rate the skilled workmen and nearly all of the less valuable men, went back to work, and all is harmonious again.

Thus incipient labor troubles which threatened to inconvenience the metal trades have been removed, so that to-day New England is freer from labor troubles than for several years. The strikes of plumbers in various cities are ending, generally by a compromise. Compared with New York the building trades generally are free from strikes. Southern New England still has its troubles, because of the reference card. Massachusetts and Rhode Island are better off, and the Northern States have hardly any cloud on their labor horizon.

The New England Foundrymen's Association will be largely represented at the convention of the National Association at Milwaukee, in June, over 20 members of the association having already expressed their intention of being members of the New England party. A committee, consisting of F. F. Stockwell, the secretary; B. M. Shaw, the vice-president, and John Magee, have made every arrangement. The party will go on a special car, which will connect with the New York party on the same train at Albany.

The well-known firm of Carl Spaeter of Koblenz, Germany, have bought the two blast furnaces and iron mines in Lorraine of the Society des Hauts Fourneaux de la Moselle. The furnaces are located at Mezières. Carl Spaeter also control the Rombach Works in Lorraine.

A patent catching machine has for some time been in operation at the Shenango Works of the American Tin Plate Company, New Castle, Pa., and is said to be working very successfully. The inventor claims this machine will displace a good deal of labor employed about the rolls.

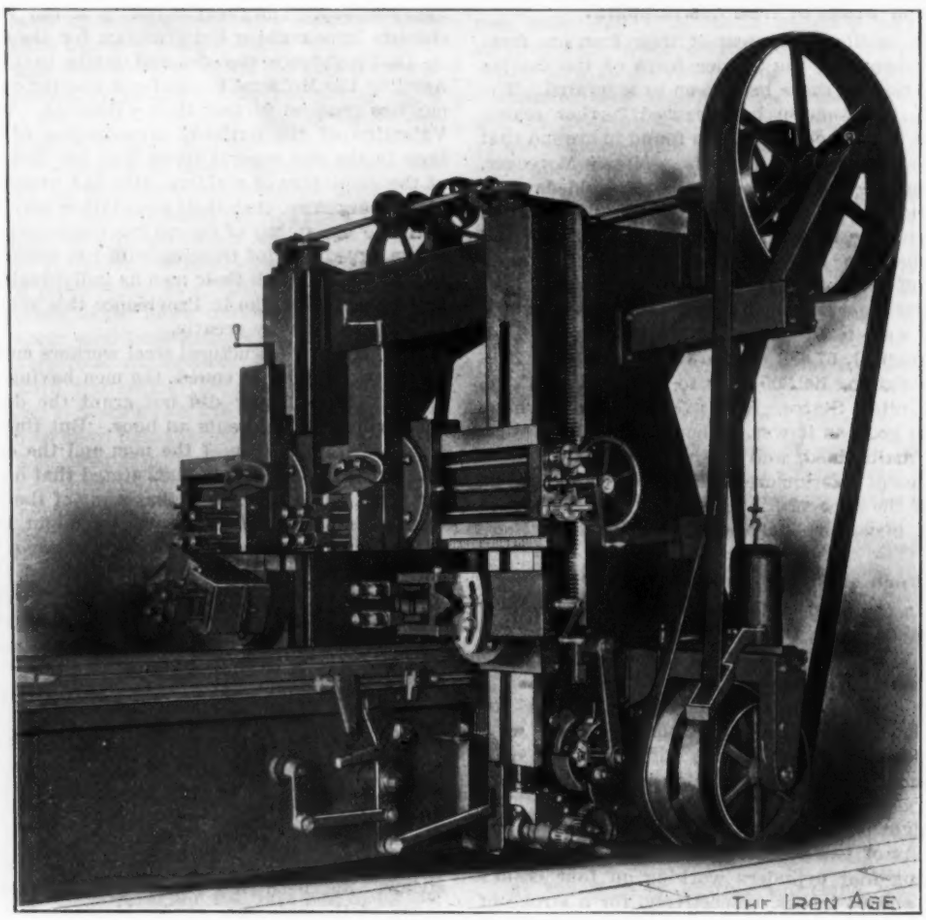
The United States Geological Survey and Railroad Location.

In an elaborate description of the new Pittsburgh, Carnegie & Western Railroad *Engineering News* prints the following:

Perhaps the most instructive location problem solved in this work was one involving the use of an atlas sheet of the United States Geological Survey with a contour interval of 20 feet. Before the issue of this particular atlas sheet the preliminary surveys and first location of the proposed line had been completed, and work was about to begin when a new resident engineer, T. H. Loomis, was appointed. Happening to be personally acquainted with the Government topographer, W. T. Griswold, who was then engaged in mapping this part of Ohio, Mr. Loomis secured from him a photograph of the contour map then almost finished. From this photographic copy Mr. Loomis projected a new location between stas. 650 and 836, effecting thereby a saving of 2200 feet in distance and 75 degrees of curvature, besides eliminating 600 feet of tunnel. This change measured in dollars and cents resulted in reducing the first cost of that portion of the road by at least $85,000. Turning to the last annual report of Charles D. Walcott, Director of the United States Geological Survey, we find that 1864 square miles of the State of Ohio have been mapped thus far, at a cost of $12,000; yet one small atlas sheet, covering some 220 square miles, has been the means of saving a sum more than seven times what it has cost to map the whole 1864 square miles. As a tribute to the accuracy of the Government topographer, Mr. Griswold, it may be well to add that when the railway engineers ran their profile levels along the paper projected line at no place did the actual elevation differ more than 16 feet from the elevation scaled off the contour map. To any engineer acquainted with the roughness of Eastern Ohio, and with the approximate methods necessarily employed in Government topographical surveys of such vast areas, these figures speak forcibly enough. And it is well that just such facts as these should become generally known, for there has been altogether too great an apathy in the past in furthering the work of the United States Geological Survey—a work that is destined to be of incalculable value to every citizen of the United States.

The Pond Electrically Driven Planer.

The L. W. Pond Machine Company of Worcester, Mass., have recently shipped to the United States Navy Yard at Pensacola, Fla., a motor driven planer of their new straight line type, which is shown in the accompanying illustrations. The machine will plane work 60 inches square, and the table is 12 feet long, on a 20-foot bed. It is designed for extreme power, being a five-shaft machine, a fifth shaft in the train of gears in the bed giving additional power. The construction throughout is unusually heavy, being designed to use the new self hardening steel tools. The motor, of the Sprague variable speed type, is placed on a shelf at the side of the planer, Fig. 2, at the foot of the housing, and its belt connected with the countershaft, which is held on arms projecting from the top of the housing at the rear. The motor will develop 15 horse-power at 525 revolutions a minute at 110 volts. The standard Navy Department rheostat panel is used. The countershaft has a normal speed of 531 revolutions a minute, and the pulley shaft makes 19.68 revolutions for every foot of table movement while cutting. The depth of the bed is 27 inches, the width between V's 36⅝ inches, the width of V's 7½ inches, and the width of table 56 inches. The face of the upright is 12 inches and that of the cross rail 21¼ inches. The planer weighs



Front View.

THE POND ELECTRICALLY DRIVEN PLANER.

60,000 pounds. The Pond Company have adopted the straight line type as their standard.

The Sligo Iron & Steel Company.—The Sligo Iron & Steel Company, who were organized in Pittsburgh in January last to take over the business of the Sligo Rolling Mills of Phillips, Nimick & Co., are rebuilding their plant at Connellsville, Pa., where a site of 20 acres was secured some time since. The plant will contain a puddling department, having 28 single puddling furnaces, muck mill, guide, bar and plate mills. All the foundations for these mills are in, and the plant is expected to start up in July or August next. The product will be iron and steel bars, plates and sheets. The company will make a specialty of the manufacture of high grade iron bars of all kinds, which was the principal output of Phillips, Nimick & Co. for 80 years, the original business having been established in Pittsburgh in 1823. The Sligo Iron & Steel Company will continue to manufacture their Sligo brand of iron bars, made of cold blast charcoal pig double hammered and double rolled, also the Tyrone brand of iron bars, which is a pure puddled pig product. In plates the concern will roll up to 66 inches wide and eventually up to 100 inches wide.

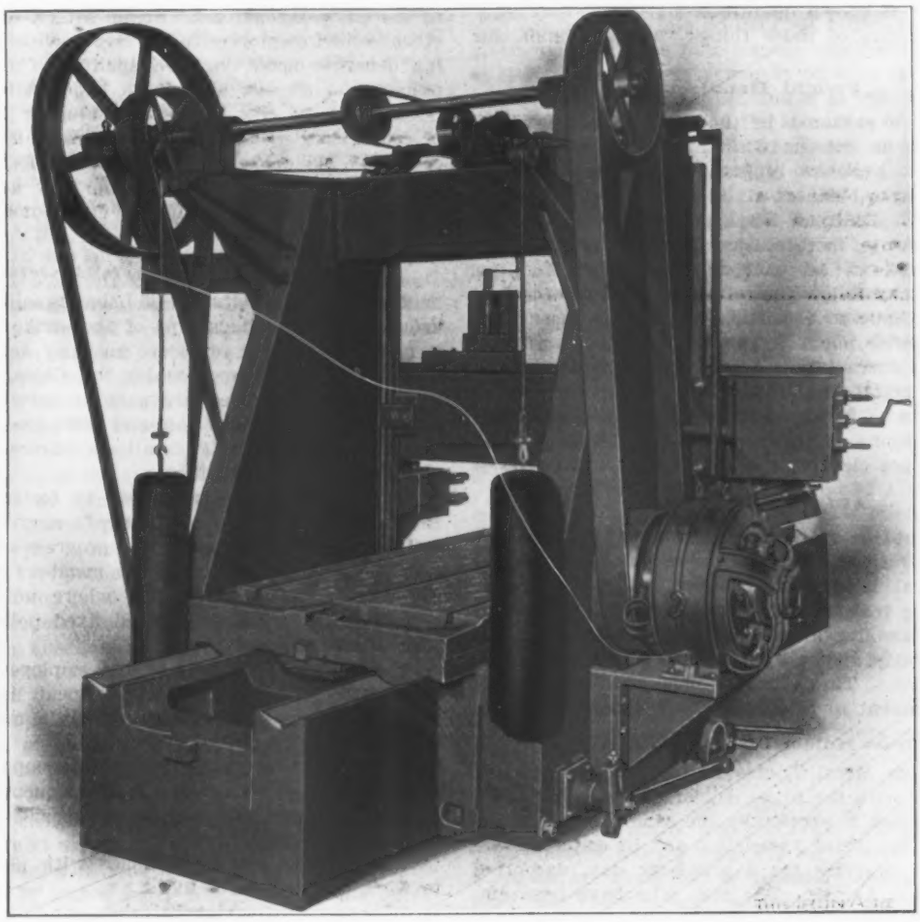


Fig. 2.—Rear View.

THE POND ELECTRICALLY DRIVEN PLANER.

The new 25-knot Cunard steamers may, at some time in the future, plow the ocean into infertile furrows; not at present, however, if the demands of the British Government continue to be what they are. It was shown at the last annual meeting of the stockholders that there would be no difficulty in placing orders with builders for these vessels at the speed named—25 knots—but the Government required that the ships should show an average velocity, voyage by voyage, of 25 knots; failing to do this they would be thrown back into the hands of the builders. To maintain a regular sea speed of 25 knots, which is nearly 29 miles per hour, the ships would have to be capable of 27 knots per hour, and no builders could be found willing to assume the risk, so the prospect of seeing the steamers afloat very soon seems remote.

A Union Declaration Against Sympathetic Strikes.—The Switchmen's Union of North America, in convention at Indianapolis, Ind., adopted a resolution declaring against sympathetic or sentimental strikes, or strikes of any kind except as a last resort under sufficient justification. The resolution characterized such strikes as detrimental to the interests of the union, as well as violations of agreements with employers. The union declared its purpose to refuse to strike in sympathy with other organizations where the interests of the switchmen themselves are not directly involved. The switchmen settle their difficulties with railroad managers through arbitrators vested with authority to act.

A prize offer for a lifting pump is published by the Austrian Minister of Commerce. The offer covers a complete project for lifting pump works to overcome the fall of 39½ m. (about 130 feet) of the Danube-Oder Canal. The aim is to secure effectual navigation by this canal with a minimum of water. The method whereby this can be achieved is not restricted to any particular plan. Three prizes, amounting to 100,000 ($20,300), 75,000 ($15,225) and 50,000 ($10,150) crowns respectively, will be awarded to the best plans submitted to the Minister. If the plan which shall be accepted is given for constructing the work to a party other than the prize holder, the latter will receive 200,000 ($40,600) crowns in addition. Bids are to be handed in before March 31, 1904. Full description of the work contemplated can be had by ap-

plying to the Austrian Legation at Washington, or the Austrian consuls at New York, Philadelphia, Chicago and San Francisco.

The Labor Situation at Chicago.

Labor demands and strikes have continued to be the most important developments affecting business interests as well as the community at large, and Chicago, in common with many other of the large cities, has experienced another strenuous week. Every few days the daily press has heralded the news that compromises were near and that industrial peace would reign in an incredibly short time. June 1 is now set for the culmination of all difficulties. But these predictions apparently are made without knowledge, as selfishness and ignorance are unknown quantities and what they may accomplish is one of those things "that no man can find out."

Freight Handlers.

Clouds have gathered in the last few days which make the outlook extremely threatening. The attitude of the freight handlers is probably the most serious difficulty affecting business at large as well as the railroad interests. Railroad managers, believing that the 25 per cent. wage increase demanded by freight handlers is exorbitant, are making preparations for the strike which may follow the refusal to meet the requirements of the union. Conditions similar to those that were encountered about a year ago are not unlikely. The report is current that important business interests have an understanding with the railroads in regard to the handling of freight, but just what an understanding of this nature can accomplish in alleviating such conditions is not clear to the laymen.

At the Stock Yards.

Laborers at the stock yards are also in a ferment following the refusal of the packers to meet the demand of the general laborers for 25 cents a day increase. Packing house teamsters, too, who struck last summer, are again demanding an increase of 2½ cents an hour, or 25 cents a day. They have refused to compromise on the proposition. They further demand that packers sign an agreement to hire none other than union men.

Brass Molders, Polishers, Etc.

The Chicago Metal Trades Association has reached an agreement with the brass molders, polishers, buffers and platers which is practically the same adjustment as was made by the Brass Association and its employees recently, which provides for a nine-hour day, excepting June, July and August. The men who have been employed since January 1 receiving 25 cents per hour, are to be raised 10 per cent.; those receiving 25 to 28 cents an hour will be advanced 5 per cent. The workers who have been employed since January 1 and not later than April, receiving 25 cents an hour, are to be advanced 5 per cent., while those receiving between 25 and 28 cents are to be raised 2½ per cent. No discrimination is to be made between union and nonunion men and all disputes are to be settled by arbitration.

Blacksmiths' Helpers.

The vice-president of the International Brotherhood of Blacksmiths has been endeavoring to settle the strike of the blacksmiths' helpers, tying up from 60 to 75 shops, but the matter is still held in abeyance.

No permanent agreement has been arrived at between the machinists, metal workers and pattern makers, on the one hand, and the Chicago Metal Trades Association on the other, the agreement still being in the hands of committees.

Bricklayers Threatening.

Building operations are said to be threatened in various parts of the city by pending strikes of the bricklayers and stone masons, who have a grievance with the Cut Stone Contractors' Association.

Four firms employing electrical armature winders have signed an agreement with the union, but the adjustment of this difficulty has been by no means general.

The City in Union's Grip.

The municipal government has not escaped the turmoil in labor circles. The assistant engineers and firemen employed at the pumping stations and calkers of the water pipe department have demanded substantial increase in wages. The unions have been told that the city cannot pay more than the present scale. Just what the next step is to be taken by the unions is not known at the moment, but the situation is regarded as serious as affecting the water supply of the city. Assistant engineers who are reciving $120 a month want $133; the firemen who are receiving $68, ask $75 a month; the calkers are paid $2.50 a day, and demand $3. In all about 140 men are affected. The oilers at the city pumping stations recently demanded a monthly increase from $65 to $75, which was granted, adding $10,000 a year to the city's expenditure. Steam fitters, machinists and other skilled employees in the city service are also making demands upon the municipality. The work of repairing the streets, already in bad condition in many portions of the city, is being held up by labor troubles of contractors. City Engineer Erickson announces that each day his department is receiving letters from the various other departments in the city service, asking for a higher wage scale, but the city is not in a position to grant the demands.

Principles of Employers' Association.

The Chicago Federation of Labor is said to have been aroused by the serious type of the strike epidemic and is making an effort to secure an early settlement. The cardinal principles upon which the Chicago Employers' Association is founded are said to have attracted the attention of the Federation, and were considered at the recent meeting of the Federation's officers. The principles declared are as follows:

"This association is formed to foster and protect the business interests of Chicago; aggressive only in maintaining the good name and progress of our city.

"To unify the action of its members and affiliated associations on those matters where united and concerted action and a determined fixed policy may seem wise and necessary.

"To secure for employers and employees freedom of contract in the matter of employment, irrespective of whether an employer or employee is a member of any organization.

"To oppose restriction of output, sympathetic strikes and boycotts, which through their frequency in the past in Chicago have been a constant menace to the city's industrial progress.

"To prevent any interference with persons seeking to work and to earn a living.

"To avert industrial disturbances; to harmonize differences between employers and employees, so that justice may be done to both sides; to favor arbitration of serious differences between employers and employees."

Machinery Manufacturers Affected.

Numerous letters received from manufacturers of machinery throughout the Northwest foreshadow the serious conditions which will result from the unreasonable demands of labor if a speedy settlement is not effected. Much business is being suspended and cancellations are anticipated. It has been sagely said within the past few days that the settlement of our present labor troubles can be brought about by evolution only, not revolution. But it should be remembered that evolution may bring revolution.

Agreement Between Founders and Molders.

The following is the text of the agreement entered into between employing founders and the molders in the Milwaukee district, the settlement of differences which was arranged by the conferences committees having already been announced:

"We, the undersigned committee, representing members of the National Founders' Association in the Milwaukee district, and Iron Molders' Unions Nos. 125 and 375, do hereby agree on behalf of our respective organizations to be governed in the future by the provisions of the following articles of agreement:

"1. That on and after May 1, 1903, the minimum rate of wages for molders in the foundries shall be $3 for floor and $2.80 for bench molders per day of ten hours, and that all molders working by the day, whose wages on March 1, 1903, were equal to or greater than the above rates, shall receive an increase of 10 cents per day over the wages paid them on March 1, 1903.

"2. The rate paid for piece work shall be such that a competent molder shall earn at least the minimum wages.

"3. Any foundry which runs overtime, except in cases of accident or causes beyond control not consuming more than 30 minutes' time, shall pay to the molders time and one-half; double time shall be paid for Sundays and the following holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving day, Christmas day.

"4. That there shall be no increase in the total number of hours at present allowed on set time work, which hours are understood to include overtime, and in setting time on new jobs it shall be clearly understood between employer and molder whether the time is straight time or includes overtime, and if so, how much.

"5. It is agreed that should the foreman or other representative of the employer fail to adjust any difference respecting output or other matter with the molder or failing to agree with him, the shop committee or representative of the unions, it shall then be submitted for decision to a standing arbitration board composed of three representatives each of the Foundrymen and the Iron Molders' Unions Nos. 125 and 375, the decision of the arbitration board to be final and accepted in good faith by both parties. Pending this decision there is to be no change in the situation as it stood immediately before the question was raised, at the instance of either party.

"6. Regulation of the apprentice system so as to compel apprentices to complete their term of four years shall be mutually enforced.

"7. It is hereby mutually agreed and understood that in case of any arrangement being made by the officers of the International Iron Molders' Union of North America and the National Founders' Association, having any reference to the question of differentials, now under consideration by the officers of either association, it shall be made a part of this agreement, and that all parties hereto shall be bound by any national agreement that may be made, or entered into between the representatives of both associations at any time during the life of the agreement.

"8. This agreement is to continue and be in force until April 30, 1904, and unless 30 days previous thereto notice of a desire to change any of the conditions of this agreement be given by either party thereto, then this agreement is to continue and be in force until April 30, 1904.

"The parties hereto pledge their best efforts to carry out this agreement in good faith. There shall be no change made in the shop practices and customs as they generally prevailed in the past year in the foundries in this district, but this shall not be construed to prevent any improved practices which may be mutually agreed upon as fair to both parties, and with the understanding that during the life of this agreement the Iron Molders' Union shall make no further demands upon the foundrymen."

Prismatic Sidewalk Lights.—The American Prismatic Light Company of Philadelphia, who have equipped many prominent buildings with their American three-way prisms, which consist of a combination of prisms and lenses used as a substitute for window plate or stained glass in diffusing natural light over dark areas, announce the perfecting and patenting of American three-way prismatic sidewalk lights. As the name implies, these lights are used in the construction of sidewalks for increasing the light in basements and cellars. They are used in conjunction with the Newhall pressed steel construction, the ordinary galvanized sheet steel construction and cast iron frames. The lights are made of a superior quality of glass, the lenses running at right angles to the specially constructed angle of the prism. They are claimed to diffuse from 25 to 30 per cent. more light than the old style walk light. Another feature of the new light is that the lens top surface acts as a safety tread, which overcomes slipping.

The National Tube Company's Improvements at McKeesport.

Last week active work was begun by the National Tube Company on the extensive improvements to existing works, and also the building of new plants at McKeesport for which an appropriation of $10,000,000 was recently made by the United States Steel Corporation. It is expected that these improvements and new works will take the greater part of two years to complete, and when finished the National Works of the National Tube Company will be the largest individual plant owned by that company. While no detailed information has been given out as to the new plants which will be installed at McKeesport, a brief summary of what is contemplated will no doubt be of interest, and is as follows:

Blast Furnaces.—It is the intention to erect a third stack, which will be 90 x 21 feet, and at the same time add some additional blowing capacity to the present plant, consisting of two furnaces. It is also proposed to rearrange the stock yards and install machinery for the rapid and economical unloading of raw materials and facilities for conveying these to the skip hoists.

Bessemer Steel Works.—It is the intention to install in this department an additional converter, of about 8 tons capacity, a hot metal mixer and a slabbing mill, also the necessary additions to the equipment, such as boilers, blowing engines, soaking pits, gas producers, &c.; the expectation being that as a result of these installations the output of this department will be increased from about 1000 tons a day to 1800 tons.

Rolling Mills.—These will consist of a 100-inch plate mill, a 24-inch, a 20-inch, a 19-inch, a 16-inch and a 12-inch mill, all for rolling skelp, and a 16-inch mill for the rolling of socket iron. The output of these mills will be approximately 1700 tons daily.

Pipe Mills.—These will consist of 12 lap-weld furnaces and 6 butt-weld furnaces, with a daily output of about 1500 tons of pipe of all sizes from ⅛ to 36 inch, both inclusive.

In addition to the foregoing, there will be installed a department for the manufacture of couplings, a foundry, machine shop, boiler shop, and other necessary shops for repairs. It is the intention also to install a new pumping and power plant, the former having a capacity of 45,000,000 gallons daily, and the latter will consist of six generators of 600 kw. capacity each, with provision for whatever additions may be necessary, the intention being to operate the pipe mills with electric power exclusively.

The St. Louis Manufacturers' Association.—We have received a copy of the report of President L. D. Kingsland to the St. Louis Manufacturers' Association, presented on May 4. He enumerated the work done by the association during the year, comprising much of local interest, but also including action on national questions which called for a vigorous expression of opinion. The association have their headquarters in the Merchants' Exchange Building, Third and Pine streets, and extend to all manufacturers an invitation to use their facilities while in St. Louis. It is expected that many manufacturers will visit that city during the period before the opening of the Louisiana Purchase Exposition and while the exposition is being held, and the St. Louis manufacturers have decided to make special efforts to give them opportunities to visit such plants as they desire to see and otherwise enable them to enjoy their stay in the city.

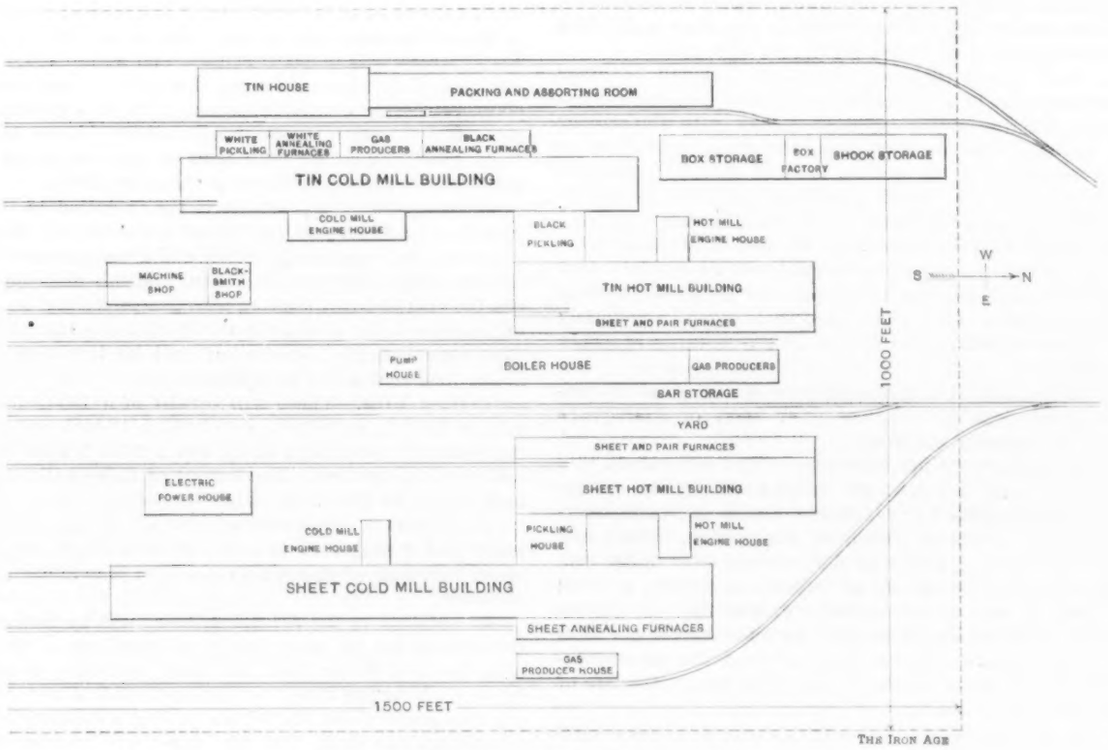
A recent improvement in steam whistles is the Quartette chime whistle, introduced by the Kinsley Mfg. Company of Bridgeport, Conn. The whistle is pitched to four tones in the musical scale, and not only gives an agreeable melodious sound, but a much greater volume of it is produced than that emitted by the brazen demon with but a single yelp.

The Colorado Fuel & Iron Company's Works.

Tin Plate and Sheet Steel Departments.

A recent issue of *Camp and Plant* contains an interesting description of the new tin plate and sheet steel departments of the Minnequa Works of the Colorado Fuel & Iron Company, Pueblo, Col., by Superintendent A. L. Conner, from which the following points are taken:

This new plant lies at the extreme south of the Minnequa Works, being 800 feet south of the new wire mills. It consists of two separate departments, as shown in the accompanying plan, one for the manufacture of tin and terne plates and the other for the manufacture of all grades of black, galvanized and corrugated sheet steel. The entire space, including buildings and yards, occupied by the tin plate and sheet mill departments is 1500 feet long by 1000 feet wide. The boiler house, which supplies steam for both departments, runs north and south and divides the plant, leaving the tin plate department on the west and the sheet department on the east. When completed the mills will have a capacity of about 200 tons of sheet and tin plate every 24 hours.



Plan of the Tin Plate and Sheet Steel Departments.

THE COLORADO FUEL & IRON COMPANY'S WORKS.

Tin Plate Department.

The tin plate hot mill building is 420 feet long by 75 feet wide, with a lean-to 25 feet wide and extending the entire length of the building. The engine house is 62 feet 3 inches long by 45 feet wide. In the main building are located the hot mills, consisting of ten stands of 26-inch diameter rolls, varying in length from 30 to 48 inches. There are also eight 36-inch and two 42-inch doubling shears, and six 36-inch, two 48-inch and one 84-inch squaring shears. This building is served by two 15-ton electric overhead traveling cranes. In the lean-to are ten sheet and pair furnaces, 5 feet 6 inches and 7 feet 6 inches wide by 8 feet long. The black pickling department, located in a building 70 x 100 feet, between the hot mill building and the cold mill building, contains two improved picklers.

The tin plate cold mill building is 640 feet long by 75 feet wide, with a lean-to 440 feet long by 37 feet wide and an engine house 165 feet long by 40 feet wide. The main building contains the cold rolls, consisting of 18 stands of rolls 22 inches in diameter, arranged in tandem—that is, the mill is arranged in three lines, each line containing six stands of rolls. This mill is served by two 15-ton electric overhead traveling cranes. In the lean-to are situated five annealing furnaces, 16 feet 6 inches wide by 18 feet 6 inches long; also seven large size gas producers for making the gas used by these furnaces. A space 75 feet long is also partitioned off in which is located the white pickling department. This department contains one improved pickling machine.

Separated by a space of 20 feet from the cold roll mill building is the tin house and assorting room, which has a total length of 720 feet. The tin house proper is 240 feet long by 70 feet wide, and contains 21 tinning stacks or machines, 21 branning machines and two double polishing machines. Its general features are shown in Fig. 2. This illustration shows the hoods for the tinning machines. Each machine will be surmounted by a stack 40 feet high to carry away the fumes. This building is served by a 5-ton overhead electric traveling crane. The assorting and packing room is 480 feet long by 50 feet wide.

Sheet Mill Department.

The hot sheet mill building is 420 feet long by 75 feet wide, with a lean-to 30 feet wide extending the entire length of the building and an engine house 62 feet 3 inches long by 45 feet wide. In the main building are located the hot mills, consisting of four roughing and eight finishing stands of 26-inch diameter rolls varying in length from 32 to 60 inches. There are also four 48-inch doubling shears, two 56-inch steam sheet doublers and three 126-inch and one 154-inch squaring shears. This building is served by two 15-ton electric overhead traveling cranes. Eight sheet and pair furnaces, 5 feet 6 inches and 8 feet 6 inches wide by 9 feet 9 inches long, are located in the lean-to. The pickling building, 70 x 100 feet, connecting the hot mill building with the cold mill building, contains one improved pickling machine.

The cold sheet mill building is 840 feet long by 75 feet wide, with a lean-to 275 feet long by 30 feet wide and an engine house 62 feet 3 inches long by 40 feet wide. The main building contains the cold rolling mill, consisting of five stands of rolls 22 inches in diameter and

varying in length from 36 to 60 inches. This building also contains a galvanizing plant of the latest design and one 150-inch corrugating machine. The whole building is served by two 20-ton electric overhead traveling cranes. In the lean-to are located eight annealing furnaces of the same type and size as those in the tin plate department. Separated by a space of 20 feet from the cold mill building is a gas producer house 142 feet long by 35 feet wide. In this building are eight gas producers, which supply gas to the annealing furnaces above mentioned.

Boiler Department.

The boiler house is 490 feet long by 46 feet 3 inches wide. One hundred and twenty-five feet of the north end of this building is given up to the eight large size gas producers, which supply the gas to the sheet and pair furnaces for both the tin plate and sheet mills. The remaining 365 feet contains 12 batteries of Stirling boilers. Each battery is of 500 horse-power capacity, making a total capacity of 6000 horse-power. There are two draft stacks for the boiler plant, each 200 feet high.

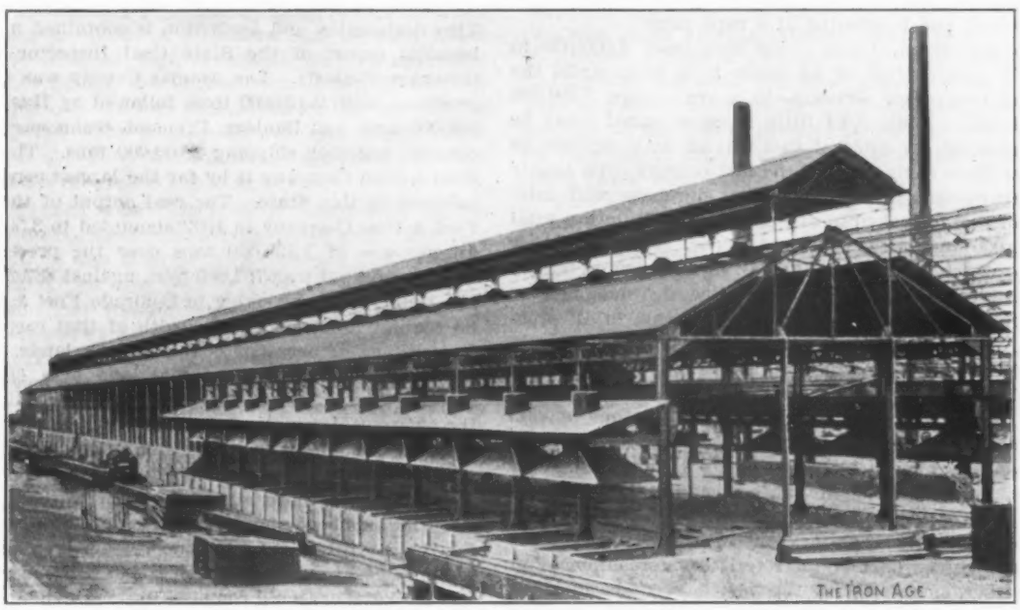


Fig. 2.—Tin House, Assorting, Packing and Storage Building.

THE COLORADO FUEL & IRON COMPANY'S WORKS.

10 feet 6 inches in diameter at the top and 20 feet in diameter at the bottom. The boilers are also supplied with forced draft by two Sturtevant fans. Joining the boiler house on the south is a brick pump house 67 feet 6 inches long by 46 feet 3 inches wide. This building will contain the pumping machinery for the entire tin plate and sheet mill plant. Between the boiler house and the sheet hot mill building is a bar yard 75 feet wide. Two bar shears are located here.

Motive Power for Plant.

The tin plate and sheet mills are each driven by 52 2-inch ropes. There are two cross compound engines, 30 x 60 x 60 inches, of the Corliss type, one for driving the hot tin mills and the other for driving the hot sheet mills. Each engine is covered by a 20-ton electric overhead traveling crane. The cold mills for both the tin and sheet mills are also rope driven, the tin mill by 21 2-inch ropes and the sheet mill by 18 2-inch ropes. The power for the tin mill is supplied by a 30 x 54 x 48 inch cross compound engine and the power for the sheet mill by a 30 x 48 inch simple engine. Both engines are of the Corliss type and each engine is covered by a 10-ton electric overhead traveling crane.

It is a noteworthy fact that in this plant there are no small engines, all machinery, such as squaring and doubling shears, corrugating machines, &c., being driven by electric motors. The electric power department, the machinery for which will be of the most modern design, will be inclosed in a building 100 feet long by 60 feet wide. This department will furnish both power and light for the entire tin plate and sheet steel plant. The machine and blacksmith shops will form another department, the building for which will be 200 feet long by 60 feet wide. These shops, which will be up to date in every respect, will take care of all the repairs of the tin plate and sheet mill departments.

The engineering corps started to lay off this plant on February 10, 1902, and the excavations for the foundations were started on February 15. Concreting was started on March 21 and brick was first laid on April 14. The first structural steel was raised on November 20. The machinery commenced to arrive in May, 1902, and is now practically all on the ground.

The Large Swedish Iron Ore Deposits.

A recent issue of the London *Engineering* contains the following: The history of the Swedish iron ore deposits at Kiirunavaara and Luossavaara, and of the company or companies handling them, is by no means a smooth one, nor has this been the case with the Gellivare Railway and other similar undertakings. It has been currently reported that a German syndicate had bought the two first mentioned deposits for a sum of kroner 40,000,000, or about $10,750,000, but this rumor appears in any case to be premature. It seems, however, to be correct that negotiations are pending with German capitalists, although some Swedish capital may also be interested in the undertaking. Great hopes were at one time entertained as to the future of these vast deposits, and the importance they were thought likely to have in connection with the further development of North Sweden; but these hopes have by degrees faded, the arrangement of a loan at more than 15 per cent. apparently bringing matters to a climax, and the deposits have now become a source of much disappointment. Swedish capitalists seem to hold aloof, and the suggestion of the State intervening has so far led to nothing. It is questionable whether the sale to a foreign syndicate can be effected without some difficulty, inasmuch as the rules of, at least, the Kiirunavaara Company exclude foreigners from being shareholders; but some loophole may, of course, be found. Another difficulty lies in the question of ownership, which to some extent seems anything but clear as far as certain positions are concerned, and it is under such circumstances quite possible that the negotiations may fall through.

Coal Resources of the Louisiana Purchase.

BY FREDERICK E. SAWARD.

The people of certain of the adjoining States who are interested in coal are promising great things in the way of exhibits at the St. Louis Exposition of the various grades of fuel found in these States. In view of this it may perhaps be interesting to present some notes relative to the traffic in coal within the area of country comprised within the celebrated Louisiana Purchase. Some very good coal territory is located within that area, and it is larger than that of many of the better known or more productive States. This coal will all come into play when the Central West is filled with a busy and a thriving population. It includes such coal-bearing States as Arkansas, Indian Territory, Kansas, Iowa and Missouri, Colorado, Wyoming and North Dakota. What a kingdom to dispose of for a few millions of dollars—a kingdom which last year produced 33,000,000 tons of coal, and is growing at a rapd pace.

The city of St. Louis alone uses from 4,000,000 to 5,000,000 tons of fuel of all kinds in a year, while the Crescent City—New Orleans—in a year takes 2,300,000 tons of coal. Louis XVI little knew or cared what he was bartering, for mineral fuel was of little account or value in those early days of the last century. To supply the northwestern part of this great purchase with mineral fuel there is taken in at Superior and Duluth a total of 4,000,000 tons in the course of a year. There are other millions which go into it by all-rail direct from certain of the great coal producing States. The threshing engine harvesting the wheat of the Dakotas is run, in all probability, with Illinois coal, if it be not from Pittsburgh. The Wabash is an institution, in the way of railroads, for this portion of the country, and so is the Missouri Pacific, and they together carried 5,000,000 tons of coal last year—in addition to their own fuel supply.

When the French were *voyageurs* on the Father of Waters, and dreaming of another empire on this continent, they never realized that one day there would be the fleets of craft upon it, carrying the product of the far northwestern part of their territory for shipment at the southernmost. Could they have ever dreamed of steel barges being used on the river? It now costs about $2000 to build a wooden barge, while a steel one can, because of better methods and more rapid and less expensive means of punching and riveting by machinery of recent adoption, be built for about $2500. As an offset to this additional initial cost is the value of the material in the old barge for making repairs of others, or for sale as scrap steel, for which there is a growing demand, while the wooden barge is a total loss after it is no longer of service as a coal carrier.

The story of coal development in this part of our country is not an old one by any means; the industry in Missouri dates back to 1840, to be sure, when 8903 tons were, by the census, reported as having been produced and shipped for use in the lead works. Next after that is the report of 4500 tons for Colorado in 1869, and about the same time coal was opened by the Union Pacific Company at Carbon, Wyoming. Kansas was doing something and so was Iowa, in even greater degree, at about this time. Arkansas and Indian Territory did not figure as coal producing centers until 1882, and North Dakota came into line in 1884. By the way, the Union Pacific Company found the coal at Sims, N. Dak., not of value as compared with the Wyoming coal, and therefore the mine was abandoned in 1887.

Here is the history of the growth of this fuel output, say from 1870 to 1902, expressed in round figures:

States.	Tons. 1870.	Tons. 1902.
Arkansas	....	2,125,000
Colorado	4,500	7,500,000
Iowa	263,582	6,000,000
Indian Territory	....	2,700,000
Kansas	32,938	5,200,000
Missouri	621,930	4,200,000
North Dakota	....	200,000
Wyoming	50,000	4,760,000
Total		32,685,000

Arkansas appears in 1882 with 50,000 tons, Indian Territory with 150,000 tons, and North Dakota in 1884 with 25,000 tons. The great Colorado Fuel & Iron Company, of which one hears so much nowadays, did not begin business, and that in a small way, until 1876.

Let us take up the States in their order and see what they are doing: In the first place we have Arkansas. M. Rafter, State Inspector of Mines, gives the total of 2,125,730 tons for last year. This is a wonderful growth, and one of which the State may well be proud. There are other and larger developments yet to come in this State from the investments by prominent Pennsylvania capitalists. The largest output is in Sebastian County, with 1,500,000 tons, followed by Franklin and Johnson counties. There is a very fine grade of semi-anthracite mined in this State, and during last year some of it went to places usually taking the Pennsylvania anthracite, because of the scarcity of the latter.

Next we have Colorado, with its 7,500,000 tons. "The coal production of Colorado for 1902 exceeds all previous records, and a few years hence the value of this State's output will exceed that of all other minerals combined." This declaration and prediction is contained in the tenth biennial report of the State Coal Inspector filed with Governor Peabody. Las Animas County was the largest producer, with 2,476,000 tons, followed by Huerfano with 900,000 tons, and Boulder, Fremont, Gunnison and Pitkin counties together shipping 2,100,000 tons. The Colorado Fuel & Iron Company is by far the largest concern in the business in this State. The coal output of the Colorado Fuel & Iron Company in 1902 amounted to 3,591,129 tons, an increase of 1,190,000 tons over the preceding year. The coke output was 752,600 tons, against 382,200 in 1901. Mr. Gould began investing in Colorado Fuel & Iron when he realized the wonderful wealth of that corporation in its millions of acres of coal and iron lands. This one company owns an area of coal land of a richness not surpassed anywhere in the country—an area larger than the entire coal region of the State of Pennsylvania. Not only the Gould management but other Eastern capital will exploit the Colorado and Utah fields, and it will be no surprise to those who have been watching how the situation has been shaping up prior to and after the fight for the control of the Colorado Fuel & Iron Company to see some great moves on the Western railroad chessboard. The Rockefeller-Gould combination will extend eventually from the Atlantic to the Pacific, and Colorado will play a prominent part in their plans.

Iowa turned out 6,000,000 tons of coal last year, and some of the largest counties were: Monroe, Polk and Mahaska, each with 1,000,000 tons; Appanoose with 800,000 tons, and then a batch like Boone, Jasper and Keokuk, Lucas and Wapello, with a total of 1,400,000 tons. There are a dozen others, each producing more or less of coal.

Indian Territory shows 2,700,000 tons, and the McAlenta district is the most noteworthy. Recently there has been a disposition on the part of Northern people to become interested in the land recently set apart by the Department of the Interior. The Missouri Pacific draws a large tonnage from this portion of our country, being interested in mining companies operating therein, while the Rock Island is also likely to do so on a larger scale than hitherto, having acquired territory within the past year.

Kansas is set down for 5,200,000 tons. Cherokee and Crawford counties are the largest shippers, having 4,670,000 tons to their credit for 1902. The Central Coal & Coke Company of Kansas City, Mo., are interested in six different fields, producing six different grades and varieties of coal. The quality of the coal ranges from the ordinary steam coal to high grade semianthracite. The company's mines are located in Missouri, Arkansas, Kansas, Indian Territory and Wyoming, a total of 45 operations being owned and worked, and arrangements are being made to open up new shafts and slopes at a number of places as fast as the product of the new mines can be utilized. The average daily production of coal is about 21,000 tons, and about 9000 men are employed at the mines.

Missouri is put down for 4,200,000 tons, of which Ma-

con County turns out over 1,000,000 tons a year, with Lafayette, Bates, Randolph and Ray counties each good for 500,000 tons. About 14 more counties are coal producers in one degree or another. The railroads of this State are great coal carriers not alone from mines in the State but from outside, and a notable example is the Missouri, Kansas & Texas. There is also talk of this line building an extension from Coalgate, I. T., to Oklahoma City, which will open a practically untouched country and will prove exceedingly profitable to the road. As soon as the United States Government makes the land allotment to the Indians practically the entire country will be thrown open for settlement, and the benefit to be reaped by the Missouri, Kansas & Texas from this action will be considerable. The allotment will hardly be made before a couple of years.

North Dakota is not a large producer, but there is plenty of lignite in the State where it can be utilized to advantage. The lignite beds on the plains of North Dakota and Montana, perhaps, reach their maximum thickness at 40 feet. A bed of this thickness, outcropping on the surface near the Little Missouri River, was carefully measured during the past summer. Beds 15 feet thick are not uncommon. Wells at Dickinson and Medora, which reach a depth of 900 feet, passed through an aggregate of 60 feet of lignite, the thickest seam being 22 feet. A bed of solid coal 25 feet thick outcrops on the side of Sentinel Butte. The gaudily colored clay bluffs which rise 200 feet above the Little Missouri are broken by four and five bands of workable lignite.

Wyoming has been called the Pennsylvania of the Northwest by reason of its extensive coal area. For last year the output was 4,760,000 tons. Of this Unita County produced 2,000,000 tons, and Sweetwater 1,300,000 tons, with Carbon and Weston counties each good for about 500,000, followed by Sheridan County with 340,000 tons.

The Texas World's Fair Commission is arranging plans for representation of the coals and lignites of the State for the St. Louis Exposition. It is proposed to have these fuels tested in a practical manner and on a large scale at the experimental plant now under construction at St. Louis. This plant will be equipped with special apparatus for testing the heating power of various fuels, and will be operated in connection with the boiler plant attached to the Mines Building. Opportunity will be given to the producers of coal and lignite in Texas to send car lots of their products to this plant for comparative tests. One extensive operator has already signified his intention of contributing 500 tons of coal, if necessary, for this purpose.

It has been said that to the sum of the influences which have built up the West the railroads have made a large contribution. "That system which had its beginning for the trans-Mississippi region when Mayor Luther M. Kennett of St. Louis, on the 4th of July, 1850, broke ground for the line which became the Missouri Pacific, had grown into a total of 56,000 miles of main track for the States and Territories of the Louisiana region at the end of 1902—more than one-quarter of the mileage in the whole United States. The Jefferson tract has at this moment 40 per cent. more railway mileage than the entire country had when the rails of Oakes Ames' and C. P. Huntington's Pacific railways met at Promontory Point, in Utah, in 1869, and it has 70 per cent. as much as the whole country had in 1883, when Henry Villard, 50 miles west of Helena, Mont., drove the spike which completed the Northern Pacific, the second of the United States' great transcontinental lines." But none of these developments would have been possible but for the development of the coal deposits. This cheap fuel has been the main source of the development—railway and otherwise.

The advisory committee on coal, appointed by the Louisiana Purchase Exposition Company, consists of Capt. W. N. Page of the Gauley Mountain Coal Company, of West Virginia; C. J. Norwood, Chief Mine Inspector for Kentucky; John P. Kebler, general manager of the Colorado Fuel & Iron Company; Gen. B. F. Bush of Missouri; R. C. Luther, general superintendent of Philadelphia & Reading Coal & Iron Company, and E. W. Parker of the United States Geological Survey.

Important Bankruptcy Decisions.

WASHINGTON, D. C., May 26, 1903.—The United States Supreme Court has just handed down two important bankruptcy decisions involving issues of special interest to the business community, the litigants in both cases being prominent in the iron and steel and hardware trades. The first of these cases was presented to the court in the form of a petition for a writ of habeas corpus by Watts & Sachs, attorneys, who had been committed to jail for contempt of court in a controversy between Federal and State courts concerning superior jurisdiction in bankruptcy proceedings. The other case, entitled Randolph & Randolph *vs.* Scruggs, trustee, involved the question as to the extent to which expenses incurred under the State laws by assignees in connection with the estates of bankrupts which are subsequently adjudicated under the Federal law, may be treated as preferred or provable obligations.

Federal Jurisdiction Supreme.

In the Watts-Sachs case the petitioners acted as counsel for the firm of M. Zier & Co., manufacturers of boilers in the city of New Albany, Ind., against whom an action was begun upon certain promissory notes by Joseph T. Ryerson & Son of Chicago. Upon the motion of the plaintiffs in the case, the New Albany Trust Company were appointed receivers by the State court, and at the instance of the Inland Steel Company the court directed the receivers to carry out and complete all unfinished contracts of the defendant company.

Pending the proceedings in the State court, the Inland Steel Company filed a petition in involuntary bankruptcy in the district court of the United States against the firm of M. Zier & Co., whereupon that court also appointed a receiver of the property of the defendant, directing him to "take into his possession the sheet iron and boiler manufacturing plant in the city of New Albany, together with all the tools, machinery, appliances, materials and finished products within and about said plant, &c." The Federal receivers thereupon demanded and took over the property from the State receiver, upon which the State court dismissed the receiver for negligence and appointed a new receiver with instructions to recover the property from the possession of the Federal court.

As the result of these proceedings Watts & Sachs, who acted both for the bankrupt firm and for the State receiver, were held in contempt by both State and Federal courts and were committed to jail for 60 days by the latter court. In handing down its decision, the Supreme Court holds as to the chief issue involved—namely, whether the authority of the Federal receiver was superior to that of the State receiver, that under the National Bankruptcy act the appointee of a United States district court is entitled to the possession of the estates of a bankrupt against whom proceedings are pending in that court without regard to similar proceedings that may be on foot in the State court. As to the petitioners, it finds that they were not guilty of contempt, either of the State or Federal court, as the evidence shows the advice given them was furnished in good faith and solely for the protection of their clients' interests. It is pointed out by the Supreme Court that in similar cases hereafter the proper procedure will be for the receiver appointed by the Federal court to become a party to the insolvency proceedings in the State court by means of which proceedings he may possess himself of the bankrupt's estate in conformity with the provisions of the Federal Bankruptcy law. The decision is regarded as of much importance, as it sets at rest all questions of conflict between the Federal and State courts relating to bankruptcy cases.

Bankrupts Must Not Resist Federal Law.

In the case of Randolph & Randolph *vs.* Scruggs, trustee, the chief question is as to the extent to which an assignee may be reimbursed for expenses incurred by him in resisting bankruptcy proceedings under the Federal law, and on this point the court holds that such expenses cannot be paid. In the case in question the appellants filed a claim against the bankrupt estate of the Langstaff Hardware Company of Memphis, Tenn., for professional services rendered the bankrupt in preparing a general assignment; for general advice and counsel to the assignee;

for services in defense of a suit brought under the State laws and for services in resisting an adjudication of bankruptcy under the Federal law. In rendering its opinion in this case the Supreme Court says:

We are not disposed to go further than to allow compensation for services which were beneficial to the estate. Beyond that point we must throw the risk of his conduct on the assignee, as he was chargeable with knowledge of what might happen. . . . None of the claims is entitled to preference under the deed of assignment. The charge for the preparation of the assignment properly may be proved as an unpreferred debt of the bankrupt. The services to the voluntary assignee may be allowed so far as they benefited the estate, and inasmuch as he would be allowed a lien on the property if he had paid the sum allowed, the appellants may stand in his shoes and may be preferred to that extent. No ground appears for allowing the item for services in resisting an adjudication of bankruptcy.

Under this decision bankrupts and their assignees under the State laws will be unable to pay for legal assistance out of the proceeds of an estate subsequently adjudicated in the Federal courts, unless such assistance has clearly been beneficial to the estate, and in no case can allowance be made for expenses incurred in resisting bankruptcy proceedings brought under the Federal law.

W. L. C.

Meeting of Marine Supervising Inspectors.

Steamboat Inspection Regulations to Be Revised.

WASHINGTON, D. C., May 26, 1903.—A special meeting of the supervising inspectors of the steamboat inspection service will be held in this city on June 3, for the purpose of making a thorough and comprehensive revision of the general rules and regulations of the service. The Board of Inspectors has for many years held annual meetings, at which modifications of more or less importance in the rules and regulations have been made, but the purpose in calling this special meeting is to recast the entire code, bringing it up in all respects to modern requirements. Such great advances have been made in recent years in boiler construction, in life saving equipment, fire protection and other auxiliaries of steam vessels, and so many changes of practice have occurred in the details of navigation, that the present code has come to be regarded as antiquated and in serious need of complete revision.

Boiler Regulations Antiquated.

A very important feature of the work of the board will be the consideration of the regulations concerning the manufacture, installation and inspection of boilers, with special reference to the representations made to the committees of Congress last winter by the American Boiler Manufacturers' Association of the United States and Canada. This association secured the introduction of a bill in both branches of Congress authorizing the appointment of a special commission to revise "all laws of the United States relating to the construction, installation and inspection of marine boilers and their appurtenances, and to suggest the enactment of such additional legislation as will effect improvement in construction of marine boilers and maintain uniformity of inspection of marine boilers in all portions of the United States and insular possessions, and to further provide a reciprocal recognition of boiler inspection certificates between the several maritime nations having marine inspection laws." This bill was favorably reported to the Senate, but no action was taken by the House committee for two reasons: First, because of the pressure of other public business in the closing days of the session, and, second, because, in the opinion of the leading members of the House committee, the Secretary of the Treasury has authority to appoint a commission without special legislation by Congress.

The failure of the bill was regretted by the Secretary of the Treasury, for although possessing limited authority to appoint commissions to investigate the details of the Government service, he has no fund from which to pay the expenses of such a commission as was proposed by the American Boiler Manufacturers' Association, and an important provision of the bill introduced in Congress carried an appropriation of $25,000 for the work. Having, therefore, no appropriation from which to defray the expenses of a special commission of experts, the Secretary can do no more than bring the matter to the attention of the Board of Supervising Inspectors, in connection with other features of the desired revision of the rules and regulations.

In statements made to the Senate committee it was pointed out by representatives of the boiler manufacturers that as the laws and rules governing marine boilers have been "built up piecemeal," there is no longer a regular or natural sequence, and in some cases the law actually militates against the best modern materials and practice. The principal reforms desired were briefly stated to the committee as follows:

The uniformity in the rules should be so complete that a boiler builder in one part of the United States may build boilers for delivery to a vessel in another part, and our standards should be, so far as posible, made to agree with those of the foremost European countries, so that the boilers of a vessel of one nation may be repaired and inspected in the ports of another without prejudice. The materials of construction should be specified and tested according to the most advanced modern standards of engineering, so that the best materials may be recognized at their full value. A precise, correct and uniform rule as to factors of safety should be embodied in the law. Not only is this not the case now, but certain of the provisions of the law in this respect are not and never have been complied with, and the law should be amended to recognize the practice which has grown up and is proved correct by the constantly increasing safety of our steamboat service.

Closely allied with these are questions of various kinds of riveted joints and the hydrostatic pressure used in accepted tests. When the law was framed most vessels in the coast and lake service had low pressure boilers, and even on the Mississippi River pressure rarely reached 150 pounds. At present 200 pounds and over are used. Better riveted joints have been developed, and their extra strength should be recognized in the law; and there is not only no necessity, but an element of danger, in carrying the hydrostatic test pressure to such extreme as the present law makes necessary. As such questions as areas of safety valves and of connecting pipes and legs between boilers are also affected by these higher pressures, the very rules which for ancient conditions promised safety tend to danger under these new ones. Finally, an entire rearrangement of the sections of the law seems necessary. Thus questions of design should come first, next materials and their inspection, then tests and factors of safety, then methods of workmanship, and finally matters of location, connections and accessories, and all conflicting sections should be harmonized.

The Treasury officials express some doubt as to the extent to which the requirements above outlined can be authorized by the Board of Supervising Inspectors with the approval of the Department. It seems probable that certain changes in the laws will be required, and Secretary Shaw is therefore prepared to recommend to Congress such legislation as seems necessary to carry into effect the recommendations of the board. It is believed, however, that Congress will be prompt to act upon any representations that the Secretary may make, and that the complete revision of the laws and regulations can be put into effect early next winter.

Fire Protection and Life Saving Equipment.

Special attention will be paid by the board to the subject of fire protection and life saving equipment. In respect to the former very careful revision of the present code is necessary, because of the enormous advance made in this class of steam vessel auxiliaries. In the early days, when the only motive power on board was furnished by the main boilers, it was found necessary to insist upon the equipment of every vessel with numerous hand pumps and other accessories, which are now wholly out of date and practically valueless in view of the equipment of large steamers with independent boilers, engines, electric and steam pumps and other similar devices, few of which, however, are recognized in the present laws and regulations.

In life saving appliances much progress has also been made, and a very careful revision is required of the schedules of life rafts, life boats, life preservers, line carrying guns and projectiles, &c., now permitted by the existing regulations. No less than 34 different types of life raft are recognized by the regulations, several of which were devised more than 30 years ago, since when very important improvements have been made. Similar conditions prevail as to life boats, life preservers, &c., and it is probable that the schedules will be very carefully weeded

with a view to eliminating everything which does not come up to a good standard of efficiency.

Marine Engineers' Strike.

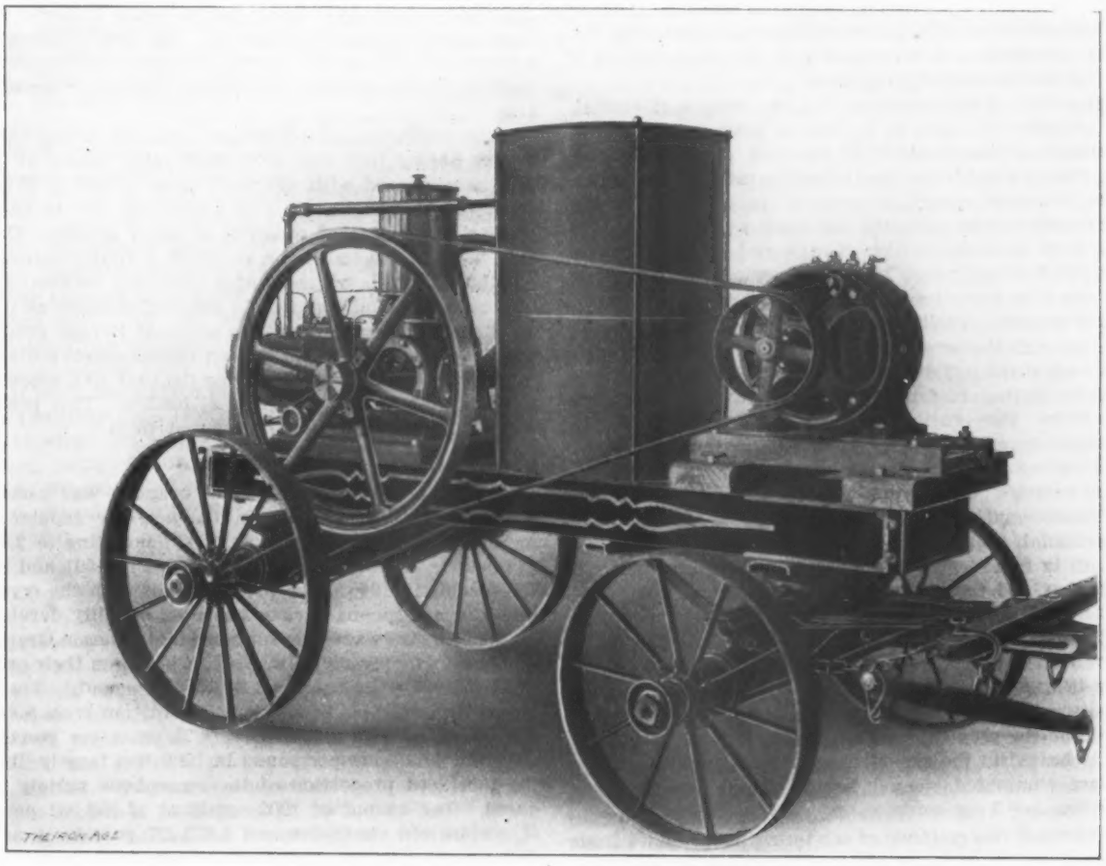
In view of the fact that the laws with regard to the issuance and revocation of marine engineers' licenses are administered by the Steamboat Inspection Service, the question has arisen whether the board at its coming meeting will take cognizance of the existing strike of engineers, and especially as to whether an effort will be made to harmonize the practice of the local inspectors in the execution of these laws. Supervising Inspector-General Uhler is authority for the statement that the Department has no plans in this regard, but that the subject may be brought up by any of the supervising inspectors in attendance upon the meeting. Secretary Shaw, Assistant Secretary Armstrong and Mr. Uhler are emphatic in their declarations that the Department intends to remain absolutely neutral with respect to the engineers' strike, and that the laws with reference to licenses are so clear and specific as not to require departmental interpretation. W. L. C.

A little more than a year ago R. T. Crane, president of the Crane Company of Chicago, published a booklet giving the results of an exhaustive investigation made by him regarding the utility of an academic or classical education for young men who have to earn their own living and expect to pursue a commercial life. Afterward he decided to go into the subject somewhat further, and he has now issued a revised and enlarged edition of 110 pages, including besides the matter contained in the former book a considerable amount of new material bearing upon this interesting subject. In his investigation he has secured the testimony of a large number of heads of universities, college graduates and prominent business men, which show a great divergence of opinions as to the desirability of a college education as a preparation for business life. The book is worthy of study, especially by those who contemplate sending their boys to college.

The Mietz & Weiss Portable Electric Light Plant.

We here illustrate a unique device. Built in New York and transported to India, it will, in that far off land, assist in gathering in the elusive rupee, and show the Hindoo fakir the latest way of doing the trick. The outfit will be drawn through the country by horses or bullocks, from one town to another, and kinetoscope or moving pictures will be presented with an arc light operated by electricity generated by the machine. Some 800 feet of conducting wire are provided so that the apparatus can be placed in any convenient location outside of the theater or hall.

The machine consists of a standard truck, built of steel throughout, upon which are mounted the kerosene engine, dynamo and water and oil tanks. The engine is of 4 horse-power of standard type built by A. Mietz, 128 Mott street, New York. It drives by belt a General Electric generator of 2½ kw. capacity. The large tank, in the center of the truck, contains water, which, by means of a small circulating pump, is forced through the cylinder jacket for cooling purposes. The oil supply is sufficient for ten hours. The weight, with full supply of oil and water, is 4500 pounds. Mr. Mietz has built several outfits of this character, which have been shipped to distant countries.



THE MEITZ & WEISS PORTABLE ELECTRIC LIGHT PLANT.

It was proposed by the builder to make the apparatus self propelling, which could have easily been done without changing the relative position of any of the parts. But the purchaser would not agree to the extra expense, and, in fact, did not think the improvement justified owing to the low prices of labor in India.

D. H. McAbee of Indianapolis, State Factory Inspector of Indiana, says that the business of selling defective second-hand steam boilers is a growing evil in the State without any law to reach it. It is responsible, he says, for many explosions.

Production of Graphite.

Annual Report of the Geological Survey.

WASHINGTON, D. C., May 26, 1903.—The annual report of the Geological Survey upon the production of graphite in the United States during 1902, compiled by Joseph Struthers, has been completed, and through the courtesy of the Director of the Survey the correspondent of *The Iron Age* is enabled to present the following advance abstract:

Classification of Graphite.

The mineral graphite is classified in the trade as crystalline and amorphous, the former constituting the finer grades, used chiefly for the manufacture of refractory products, lubricants, electrotypes, &c., and the latter being of inferior quality and suited only for foundry facings, paint, stove polish and similar products. Some of the amorphous variety, however, especially that from Bavaria and Mexico, is utilized also in the manufacture of pencils and in electrotyping work.

The bulk of the supply of the best grades of crystalline graphite continues to be derived from Ceylon, which furnishes at present about 80 per cent. of the total consumption of graphite in the United States. Ceylon graphite is imported direct by steamer in packages of 600 pounds net weight each, the ore being sorted and graded into four products, which in the order of value are "lump," "chip," "dust" and "sweepings." The lump and the chip varieties are used chiefly in the manufacture of graphite crucibles and for electrical purposes, and the dust and the sweepings are utilized mainly for facings and stove polish. The consumption of crystalline graphite in the arts and manufactures is approximately as follows: For crucibles, 55 per cent.; stove polish, 15 per cent.; foundry facings, 10 per cent.; paint, 5 per cent.; for all other purposes, 10 per cent. The last named division includes powder glazing, electrotyping, steam packing, pencils and various minor uses.

Artificial graphite is manufactured in the electric furnace in two forms, one being the so-called graphitized electrodes and the other artificial graphite. To produce the former the ordinary electrode, which is composed of a mixture of petroleum coke, pitch and a carbide forming material (silica or iron oxide), is submitted to the great heat of an electric furnace and the whole becomes graphitized, furnishing a product having special qualities. For the production of artificial graphite anthracite coal is heated in the electric arc furnace and the impurities are eliminated, the ash being reduced in some cases to as low as 0.5 per cent.

There are two methods of concentrating graphite from its ore, the wet and the dry. No mill has adopted the dry or air method in its entirety on account of the gravities of the component parts of the ore being so close to one another. Several pneumatic processes have lately proved a partial success, but they have been of limited application on account of the inability to remove the small scales of mica which occur in some of the deposits. The wet or water method of concentration has been developed to a marked degree of efficiency and is the one now used by the operative companies. The general method of procedure is to crush the ore, stamp it wet, separate coarsely by stationary buddles, the concentrates being dried and further treated with buhr stones and screens. In the mill of the North American Graphite Company an improvement has been made by the use of the Brumell separator, which treats the dried ore by flotation upon rather than immersion beneath the surface of the water.

In spite of the development of the manufacture of artificial graphite by the electric furnace, the demand for the natural product has increased very largely in recent years because of the growth of the iron and steel industry, the largely increased use of copper and its alloys, the increased need for lubricants, and the development of electrical machinery which calls for graphitized products. During 1902 but little more than one-tenth of the total consumption of natural graphite in the United States was of domestic origin.

Production.

The production of crystalline graphite in the United States during 1902 amounted to 4,176,824 pounds, valued at $153,147, as compared with 3,967,612 pounds, valued at $135,914, in 1901. The greater part of the product was derived from the mines at Ticonderoga, N. Y., although the mines at Chester Springs, Chester County, Pa., and at Stockdale, Clay County, Ala., contributed to the output. Considerable progress has been made in developing mines, notably at Ticonderoga, by the Columbia Graphite Company; at Dillon, Beaverhead County, Mont., by the Crystal Graphite Company; at Laramie, Albany County, Wyom., by the Copper Cliff Mining Company, and near Graphiteville, McDowell County, N. C. Exploratory work was done during the year at the graphite properties 8 miles southwest of Raton, Colfax County, North Mexico, and an output of 65 short tons of high grade amorphous graphite was shipped to Moosic, Lackawanna County, Pa., for manufacture into paint and foundry material. In the aggregate about 2000 short tons of crude material have been mined during development, and are awaiting the erection of mills or the results of experimental work carried on for the selection of a proper process of concentration.

The production of amorphous graphite in the United States during 1902 was 1209 short tons, valued at $19,764, as compared with 809 short tons, valued at $31,800, in 1901. The decline in unit value was due to the increased proportion of products of lower grades. Under this head are included the so-called graphite anthracite of Rhode Island, which is of a structure between scaly and granular, and contains in selected samples as much as 52 per cent. carbon, and the so-called Baraga graphite of Michigan, which in reality is a carbonaceous schist.

The imports of graphite during the year 1902 amounted to 18,201 long tons, valued at $1,168,554. This product was all imported in unmanufactured form.

Artificial Graphite.

The manufacture of artificial graphite has assumed a very prominent position in the graphite industry in recent years, the production in 1902 amounting to 2,358,828 pounds, as compared with 2,500,000 in 1901 and 860,750 pounds in 1900. The production of both the crystalline and amorphous variety has been steadily developed by the sole producers, the International Acheson Graphite Company, at Niagara Falls, N. Y., who begun their operations in 1897 with a product of 162,382 pounds. The decrease in unit value of the total production from 8 cents per pound in 1899 and 1900 to 4.75 cents per pound in 1901 and 4.69 cents per pound in 1902 was largely due to the increased proportion of the amorphous variety produced. The output of 1902 consisted of 883,591 pounds of graphitized electrodes and 1,475,237 pounds of artificial graphite in the granular or powdered form. The electrodes were used in electrolytic processes for the production of caustic soda and of chlorine and metals in chloride solution; also in electro-metallurgical processes, such as the production of calcium chloride, the electric smelting of copper and iron ores and the manufacture of various iron alloys. The artificial graphite in the form of grains and powders was used chiefly in the manufacture of paint, dry batteries and commutator brushes, although a considerable quantity was used in the manufacture of lubricants, in electroplating work, and in certain chemical processes requiring a carbon of exceptional purity.

Occurrence and Production in Canada.

Graphite occurs in Canada both as amorphous and as crystalline, the former grade being found chiefly in Nova Scotia and New Brunswick, where it occurs as graphitic shale or clay, and the latter variety occurring notably in Ottawa and Argenteuil counties, Quebec, and in similar deposits in Lanark, Leeds and Frontenac counties, Ontario. The most important of the amorphous deposits are in the vicinity of St. Johns, New Brunswick, although other deposits of lesser note are located in Kings and Westmoreland counties, New Brunswick, and at the Lochaber mine, Nova Scotia. Amorphous deposits have also been found in Haliburton and Hastings counties, Ontario, and in Renfrew County, Brougham Township, is a

very extensive deposit of this character, which carries also considerable crystalline graphite. The Ontario Graphite Company operated this last named deposit during 1902. The value of the output in Ontario during 1902 amounted to $17,868.

The crystalline variety occurs in two distinct forms—namely, lump and disseminated. The lump graphite generally occurs in limestone in the form of nodular masses or small veins, although in a few cases the ore is in small veins in diorite or other igneous rock. Up to the present time the lump deposits have not warranted systematic mining.

The disseminated graphite is of the crystalline or flaky variety, and occurs in gneiss, assaying up to 35 per cent. carbon. According to H. B. H. Brumell these bands of gneiss are considerably developed in the townships of Buckingham and Lochaber, Lochaber County, Quebec, many beds having a thickness of 20 feet or over, and the product assaying about 20 per cent. graphite. A few of these beds have been opened, and considerable quantities of ore extracted and treated at the various mills in the district, more especially in later years at the mills of the American Graphite Company, the Buckingham Company and the Walker Mining Company.

The following companies were interested in graphite mining in Canada in 1902: In New Brunswick, the Canada Paint Company, near St. John Station; in Ontario, the Ontario Graphite Company, Brougham, and the Globe Refining Company, Port Emsley; in Quebec, the North American Graphite Company, Buckingham; the Walker Mining Company, Buckingham; the Calumet Mining & Milling Graphite Company, Calumet, and the Grenville Graphite Company, Grenville (formerly Keystone Graphite Company). Of the above named companies the North American Graphite Company contributed regularly throughout the year. The Ontario Graphite Company did not begin to produce until August, nor the Globe Refining Company until December. The Canada Paint Company acquired 500 acres of mineral land at Peticodiac in January, 1903. The production of graphite in Canada during 1902 amounted to 1995 short tons, valued at $28,300, as compared with 2005 short tons, valued at $38,780, in 1901. W. L. C.

Canadian News.

Manufacturers and the British Preference.

TORONTO, May 23, 1903.—Mr. Chamberlain's Birmingham speech, committing himself, if not his Government as a whole, to the principle of intra-Empire preferences was well received by the Canadian public. On that issue the two political parties are now, to all appearance, agreed. Of course, the adhesion of the Liberals, who are in power in Canada, is more recent and more wavering than that of the Conservatives, who embraced the idea of mutual preferential trade between Canada and the United Kingdom at the time it was first broached and have clung to it since. But it was Sir Wilfred Laurier's Liberal Government that first launched the idea into practice. The present preference to British goods, now amounting to a discount of 33 1-3 per cent. on general tariff rates, was introduced by that Government. At the outset, however, the Laurier Government had not so much in mind the purpose of favoring the British as of giving effect to pre-election pledges to reduce protection. In 1897 the concession of 12½ per cent. to Great Britain was described as a reciprocal, not a preferential, abatement. It was given to Great Britain, and, on account of Canada's implication in commercial treaties between Britain and certain other powers, it had to be given to these other powers as a matter of "most favored nation" right. But apart from the extension of the reciprocal tariff as a consequence of these treaties, there was a voluntary extension of it to other nations, who were supposed to be giving Canada an equivalent. For according to the original terms of the reciprocal clause of the Fielding tariff, all countries giving Canada equal privileges were entitled to the 12½—or subsequent 25—per cent. discount.

It was as a device for modifying the farmer protective tariff that the arrangement was at first defended. It was held forth as a step toward free trade. When Sir Wilfrid Laurier, a few months after the inauguration of the new scheme, was in England attending Queen Victoria's second jubilee, he made a speech at Liverpool disclaiming any desire on the part of his Government for a British *quid pro quo*, holding that Britain gave enough already in the concession of a free market to Canada, and further contending that for Britain to adopt customs duties in order to exempt Canada from them would be reactionary. A year or two later the general reciprocal character of the tariff discount was changed to a purely British preference, which was afterward increased to 33 1-3 per cent. Thus the Liberals were drawn squarely upon the platform of preferential trade, not as a measure of free trade, but as a means of favoring Britain and unifying the Empire.

When the Canadian Ministers were in England last year attending the Colonial Conference they succeeded in having a resolution passed that is the very opposite of the sentiments expressed in Sir Wilfrid Laurier's Liverpool speech of 1897. The resolution in question urged on the Imperial Government the expediency of granting in the United Kingdom preferential treatment to the products of the colonies. Canada's representatives expressed themselves as willing to recommend in return an additional preference to British manufacturers on a list of selected articles in one of the following ways: First, by further reducing the duties in favor of the United Kingdom; second, by raising the duties against nonBritish countries; third, by imposing duties on certain goods now free, coming from nonBritish countries.

At the time the Imperial Government was unable to accede to this proposal, Mr. Chamberlain himself objecting that the change would be an important departure from the established fiscal policy of the United Kingdom, adding that if the proposal could be entertained at all it would be necessary for Canada to offer some more material advantage than was contained in the proposition.

Now that he has declared himself ready to test British public opinion on the question at the next election, there is considerable hope here that something will be done. Of course, the Canadian farmers are enthusiastic for the arrangement. But the Canadian manufacturers are not. Their feeling is probably expressed with fair accuracy by C. A. Birge, president of the Canadian Manufacturers' Association, who spoke as follows in an interview: "There are many manufacturers, and I am one of them, who think that the present preference is already too large, and I read with a great deal of pleasure the remarks of the Finance Minister when delivering his budget speech recently, in which he outlined the possibility or probability of lowering it or removing it altogether. My own personal opinion is, and has been, that it would be better for Canada to have the one tariff for all, and, if necessary, to shoulder her share of the burden in connection with Imperial defense. I have never had much faith in the idea that a preferential tariff would draw closer the bonds of unity between Canada and the Motherland, and thus far Canada's course in that direction has not seemed to have accomplished much."

In his recent budget speech, Mr. Fielding, the Canadian Finance Minister, spoke as follows on the subject: "Putting aside other considerations, if the British Government and people do not show any appreciation of the value of the preference, then, so far as the British Government and people are concerned, they cannot complain if we see fit to modify or change that preferential tariff. Of course, there would still remain the more important consideration, how far, if at all, that tariff could be changed, with due regard to the interest of the masses of the Canadian people."

Dry Dock Subsidies.

Mr. Fielding's resolution to increase the subsidy to dry docks is likely to prove fruitful. Previously the Government's power of assistance was limited by law to the paying of interest at the rate of 2 per cent. on the cost of all dry docks built by private parties, but the payment was not to exceed $20,000 a year. By the Fielding resolution the Government may pay 3 per cent.

per annum, and the total expended may be as much as $30,000 a year. A dry dock was constructed under the farmer act at Halifax, and the British Government and the municipality of Halifax had contributed to its cost as well as the Dominion Government. A new dry dock is being built at Collingwood, Ont., and it is probable that one will be built at Vancouver, B. C. Another is contemplated at St. John, N. B. Since the announcement of the increase in the Government's assistance it has been proposed to build a dry dock also at Sydney, Cape Breton, in connection with shipbuilding works there.

Rolling Mills Purchase.

The entire properties and good will of the Pillow-Hersey Company, Montreal, have been bought by the Montreal Rolling Mills Company. The sum paid is said to be $600,000. The two properties are thus joined under a new company, the leading interests in which have been prominent in the Montreal Rolling Mills Company. E. S. Clouston, general manager of the Bank of Montreal, is president, and William McMaster, general manager, of the new company. The Pillow-Hersey Company, who have been in existence since 1851, were the first concern to manufacture nails in Canada. Mr. McMaster has been elected a director of the Dominion Iron & Steel Company. C. A. C. J.

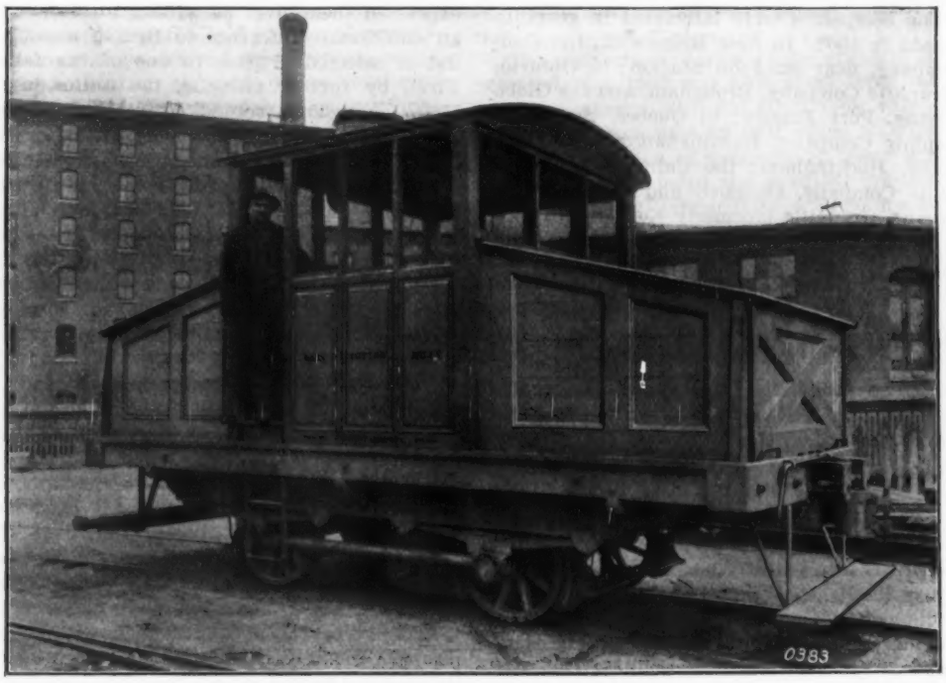
Why "Engine" Lathe?—An official of one of the largest lathe building concerns of New England is desirous to learn why the word "engine" is coupled with a lathe. He has looked up the derivation of engine lathe without results. He asks that *The Iron Age* present the question to its readers, hoping to gratify what he calls his curiosity.

A proceeding in mandamus was begun at Pittsburgh last week by the Clyde Coal Company against the Pittsburgh & Lake Erie Railroad Company, in which it is claimed the railroad is discriminating against the coal company in furnishing cars. The court is asked to compel the railroad to furnish the coal company with as many cars as they need, and if the supply is not sufficient that the company be compelled to furnish a *pro rata* share of cars to the coal company as compared with the number other companies get.

The Hunt 20-Ton Electric Locomotive.

The electric storage battery locomotive built by the C. W. Hunt Company of West New Brighton, N. Y., has been designed with special reference to the economical handling of material in mills or other manufacturing establishments. It frequently happens that a single carload of raw material has to be distributed at various parts of the works, and in such cases much costly rehandling can be saved by shifting the entire car from point to point and discharging each portion of the load exactly where it is required. A similar economy can be effected by collecting the finished product at the different buildings and loading each consignment directly into its proper car. The locomotive in question is used for shifting cars while loading or unloading in this manner, and also for transferring material in course of construction from one shop to another.

A locomotive of this type has recently been installed at the works of the Massachusetts Cotton Mills in Lowell, Mass. The original buildings have been improved and extended to meet the requirements of the growing business, and new structures have been added from time to time until the entire plant covers a considerable area. The freight siding is separated from one of the two principal storehouses by the main business street of the city, and from the second of these storehouses by the canal which supplies the turbines of the mill. It is necessary to deliver carloads of baled cotton at either or both of these buildings. Neither a steam nor a trolley electric locomotive is permissible in the storerooms on account of the fire risk.



THE HUNT 20-TON ELECTRIC LOCOMOTIVE.

Before installing the locomotive the cars were shifted, one at a time, by three horses harnessed up tandem. The storeroom at the canal is so constructed that the horses would have no means of exit if driven in ahead of the car, and this necessitated sending it in "on the fly." The bridge across the canal is just wide enough for the car tracks, and the horses had to turn out before reaching it. To get up speed it was necessary to start some distance up the track, the tag holder (the man at the coupling), the driver and the horses all traveling at their best gait. At the proper moment the tag holder unhooked the tag or rope fastened to the traces and ran out in front of the car. The consequence of a slip or false step are self evident. In the case of a heavily loaded car, the horses were unable to give it sufficient momentum

and the operation had to be completed by the loading gang.

This locomotive is built for the standard 4 feet 8½ inches gauge, and fitted with M. C. B. standard couplings, making it suitable for use with any ordinary railroad car. The length over the bumpers is 21 feet 4 inches, and the hight from the railroad to the top of the cab is 12 feet 1 inch. The wheel base is 7 feet 6 inches, and permits the operating of the locomotive over a comparatively small turntable. It weighs about 20 tons, and runs at a speed of from 2 to 4 miles per hour on level track.

As will be seen from the engraving, the locomotive is perfectly "double ended," the cab being located directly in the center. This makes a very desirable arrangement for switching work, which calls for operation in both directions with equal facility. The batteries are contained in the sloping compartments at either end. This symmetrical disposition distributes the weight evenly on the four wheels, and, as each of these is a driver, the entire weight of the locomotive is usefully employed in traction. The wheels and axles are driven from the gear cases in the cab by means of Renold silent chains suitably inclosed. These chains are the only portions of the driving gear situated below the car body, the motors and gear cases being mounted in the cab where they are readily accessible and always under the immediate notice of the operator. Under these favorable conditions any reasonably reliable man can be depended upon to maintain the electrical equipment in proper working condition.

The battery was furnished by the Electric Storage Battery Company, the elements being mounted in tanks of extra depth to prevent the electroyte from splashing over the top. In mounting the battery special attention has been paid to protecting it against injury due to the shocks to which the locomotive is exposed in switching.

There are two motors, specially wound for the service. By connecting the two motors in series or parallel, and by varying the arrangement of the fields, an efficient speed control is obtained without wasting any of the energy of the battery by passing it through a resistance. The controller is of the standard vehicle type, and has two levers which control every desired motion of the locomotive. The reversing lever is set to point in the direction in which the locomotive is to move, and the second lever controls the speed. These levers are mechanically interlocked, as in the case of a trolley car controller, so that the motors can only be reversed when the speed lever is in the off position. The locomotive may be run with the controller in any notch, there being no transition point on which a careless operator might leave his lever and burn out the apparatus.

As already mentioned, the speed reducing gearing is located in the cab, instead of being beneath the car body. All the gears are machine cut and run in a bath of oil, in fully inclosed gear cases. The company's regular flexible and insulated coupling is used for connecting the motor to the gear case. There is a separate gear case for each of the two motors. The driving gear consists of two parts, which are exact duplicates of each other. In an emergency one motor could be cut out entirely and the locomotive operated by the remaining motor, but with a reduction of hauling capacity. The speed reduction of the gear case is so proportioned to the safe discharge rate of the batteries, the safe capacity of the motor and to the weight of the locomotive that neither the batteries nor the motors can be dangerously overloaded.

The driving axles are made to the M. C. B. standard dimensions and run in roller bearings, which reduce the friction at these points to an inappreciable amount. The wheels are shrunk in place and have chilled treads and flanges of M. C. B. standard size and shape. A powerful brake is conveniently located in the cab. An alarm gong is also provided.

Experience has shown that in light switching service the batteries can be recharged at various times during the day while the locomotive is waiting between hauls. For heavier service it may be necessary to charge during the noon hour or after working hours in the evening. The battery is automatically protected during charging by well-known safety appliances, which open the circuit if the current is excessive, and also when it drops so low as to indicate that the battery is fully charged.

Electrical Developments in Europe.

LONDON, May 9, 1903.—The completion of the electrification of the Mersey Railroad, Liverpool, last Saturday night marks a new epoch in the history of electrical undertakings in this country. An hour or so after midnight the last steam driven train left the Mersey Railway, and by five o'clock on the Sunday morning a three-minutes' service of electric trains was in operation through the tunnel. The Mersey Line is the first steam railroad in Great Britain to undergo the process of electrification. The tunnel under the Mersey, driven through the solid sandstone, was formally opened in 1886. Though this railroad has carried some 10,000,000 of passengers a year, it has not proved a financial success, owing in no small degree to the smoke and dirt in the tunnel engendered by the steam traction, coupled with the expenses of driving an elaborate but unsatisfactory system of ventilating fans. In July, 1901, a contract was entered into with the British Westinghouse Company for the electrification of the line, and the work has been completed in a year and three-quarters.

Electrical Power on Railroads.

Special Parliamentary powers are required for any transition from steam to electric power. To obtain Parliamentary powers in this country is a formidable undertaking, so to facilitate matters the Government is introducing the Railways (Electrical Powers) bill. This bill consists of seven clauses, the first of which contains the most important provisions of the measure, and runs, in part, as follows:

With the object of facilitating the introduction and use of electrical power on railways the Board of Trade may make orders authorizing a railway company to use electricity in addition to or in substitution for any other motive power, and for any other purpose; to construct and maintain generating stations or other electrical works on any land belonging to the company; to make agreements with any body corporate or other person for the supply to the company of electrical power or the supply to or use by the company of any electrical plant or equipment, &c.

Electric Power Distribution in Great Britain.

I think readers of *The Iron Age* are already familiar with the general methods by which Great Britain has been mapped out into districts, each district being supplied with generating power from a head center. This mapping out of England into electrical areas, although attracting comparatively little public attention, is none the less an event of great importance. Already 14 schemes have been put forward, covering almost the whole of the most important manufacturing area of the country, including the Clyde Valley, the Northeast Coast district, Lancashire, the chief industrial part of Yorkshire, the busiest part of the Midlands, a large part of the Metropolitan area and the South Wales iron and steel making centers, besides other districts. The benefits of this power distribution will be seized upon in the main by small users of power.

The Yorkshire Electric Power Company, who are concerned with the Yorkshire district mentioned above, have commissioned H. F. Parshall to inquire into the question of electric power supply on their behalf, and his report gives some figures which may be taken as typical, and will be of interest in connection with this subject. The district which the company are authorized to supply has an area of approximately 1800 square miles, in which are the five county boroughs of Bradford, Halifax, Huddersfield, Leeds and Sheffield, besides urban, rural and local authorities, the total population being over two and a half millions. The company have not entirely a free hand over the whole of the district, but in certain cases must make terms with the corporation authorities. It has been roughly estimated that 2,000,000 horse-power is used in this district. This may be an excessive estimate, but 1,000,000 horse-power is said to have been accounted for. It is intended to erect at first a station between Huddersfield and Dewsbury, which will contain a plant capable of generating 10,000 kw., half the installation of machinery being provided for at first. The present arrange-

ment is to establish four generating stations in various parts of the district.

European Electrical Machinery.

Last month, before the Departmental Committee on Electricity in Mines, Selby Bigge, a contractor and electrical power engineer and electrical machinery adviser, stated that he had now under consideration a number of very large schemes for the centralizing of groups of collieries and doing all the work of the colliery by electrical machinery. He found that whenever he wanted electrical machinery for work on a large scale he had to get it from America, or Germany, or Belgium, and we were at least four or five years behind those countries in the application of electrical machinery.

This charge of general incompetence against British manufacturers and users was resented a week later before the committee by C. W. Mountain, a well-known electrical engineer of Newcastle-on-Tyne and a member of the advisory committee of the coal trade for Northumberland. He repudiated the statements that if one wanted large generators he must go to the Continent of Europe or America for them. The principal reason was because English manufacturers were too busy and were not prepared to take them at the price that the foreigners took them at. It was only fair to Britishers that he should combat that statement, and he was only doing his duty to the electrical trade of the country in repudiating the statement that for large machinery they were compelled to go to America or Germany.

Electrical Railroad Work in North Italy.

The recent visit of inspection of the Institution of Electrical Engineers to the electrical railroads in the North of Italy has created considerable interest. A representative deputation it was, comprising the president, R. Kaye Gray, Col. R. E. Crompton, S. Z. de Ferranti, Prof. S. P. Thompson and the secretary of the institution, W. G. MacMillan. Into the full work of this deputation I cannot now enter, but in connection with the subject of this article, the journey over the electrified section of the Adriatic Company's railroad between Lecco and Sondrio, on the Lake of Como, is of especial interest. This piece of railway is particularly interesting at the present juncture as being one of the few cases where large companies have converted a long section of railway, designed for high speed traffic, from steam traction to electricity. The current distributed throughout the line from the large generating station at Morbegno is generated at a pressure of 20,000 volts. From this tension current is reduced, for working through the motors, to a pressure of 3000 volts. The fact that for the last nine months, since the electrification has been complete and the system opened for public traffic, no difficulties due to high tension currents have arisen speaks for itself.

Over 67 miles of such a railway as this, through a country of surpassing beauty, were the electrical engineers of England conveyed by the Adriatic Company of Italy, at a speed that for the greater part of the distance was equal to nearly 41 miles per hour. No secret was made by the official representatives of the railway of their complete satisfaction with the working of the system so far, and of the intention of their company, after further experience, to extend the conversion of their steam lines to electricity, working on the same system. There can be no question of the economy in cost of distribution that the methods adopted afford, and inasmuch as the old stock of the railway, drawn either by a motor carriage or by an electric locomotive in the case of freight trains, is still in service, while there is no interference with the working by steam locomotives where necessary, many of the difficulties foreseen in the conversion of steam lines have been overcome.

As a strong contrast to the interesting experiment of the Adriatic Railway Company in adopting the high tension three-phase system for their electrification, the details of the policy of the Mediterranean Company, conceived on quite other lines, have been disclosed to the party of English engineers. Between Milan and Porto Ceresis, on Lake Lugano, a line has existed, doing a fair amount of business with steam traction for some time. The length of the line thus electrified is about 45 miles, and, as regards gradients and curves and in its general features, it is a fairly representative piece of railway, upon which a general business, both through and local, for passengers, and with ordinary services for freight, is done.

The work of electrification was put into the hands of the Thomson-Houston Company, who carried it out with their well-known and generally approved equipment. The power generating station, situated about centrally on the line, was designed to make use of the flow of the river Ticino, but, in consequence of concessions and other difficulties, the plant is now being driven by steam, with economical results that are said to give satisfaction. Electric current, originally generated in alternators at 13,000 volts pressure, is distributed to seven substations conveniently situated, where transformation in form and pressure takes place, to produce eventually a continuous working current of 650 volts pressure, that is fed into a third rail placed outside the running rails. The experience of the English party over the line should have convinced the most skeptical that the popular idea of a sliding shoe being against high speed was a mistaken one. The motor car, weighing about 40 tons, with a total motor capacity of about 600 horse-power and seating accommodation for 63 passengers, drew a train of three trailing cars, all similarly fitted, but without motors, over this piece of line, by no means an easy section, at an over-all speed of nearly 50 miles an hour, with such smooth and perfect running that all were pleased and delighted.

Electric Traction on Swedish State Railways.

From Italy to Sweden is a far cry, but here again we find electrical developments, particularly on railways. The huge waterfalls of Sweden are being exploited every year in greater degree, and it is expected that before long their effects will be felt on the State railroads. The board of these railroads has recently presented a report upon this subject, and it may be inferred from this report that before many years have passed electrcity will be the motive power. It is the opinion of the board that there is in various parts of Sweden sufficient power available, partly in the shape of waterfalls and partly in the shape of peat deposits.

Electrical Work in Russia.

Putting on one side the development of electricity in France and Germany as being too well known to need much comment, I observe the growth of electrical power in Russia. The first central station in St. Petersburg for lighting was installed in 1881, the power being 250 kw. At the present time the power on all the central stations taken together, exclusive of private stations, is 15,000 kw. The number of private stations is estimated at 300, with a total capacity of 39,000 kw. St. Petersburg is a sample of what is happening in the large towns of Russia. Up to now, in the main, it has been used for light, and in a secondary degree for tramways. But already ideas for the further utilization of electric power for industrial purposes have been mooted. S. G. H.

Photographs of steel sections were sent to the master mechanic of a railway with a request that he would select one from the broken ingot which seemed the most suitable for his purposes. After he had made a choice he was to look on the back of the photo, when he would find further details. The master mechanic followed the directions, but was surprised, says *Locomotive Engineering*, to discover that the photograph had been taken from a ginger snap!

The State Legislature of Texas has voted $50,000 to build a new 50-ton charcoal furnace at Rusk, the machinery for which has not yet been purchased. They are now working about 250 convicts to operate Old Alcalde Furnace, which has an annual capacity of 10,000 tons, and adjoining cast iron pipe works. The product of the old stack is car wheel, foundry and basic pig iron. J. F. Cochran is superintendent.

The Gas Power & Engine Company of Morris Heights, N. Y., have been awarded the contract for the building of one of the two new gun boats for the United States Government, bids for which were opened May 18. Bids for the other vessel will be readvertised.

Notes from Great Britain.

The Market.

LONDON, May 16, 1903.—The British iron and steel market no longer presents that homogeneous appearance which has characterized it during the last six months. In Glasgow there has been a slump in Cleveland warrants, a marked depression of Glasgow warants, and on the top of everything the engineers' strike. Lancashire presents its usual solid front to all and sundry, but in the Midlands there is uncertainty and doubt. In South Wales, on the other hand, there is greater activity in the iron, steel and tin plate markets, more so than for many months past. The tin plate trade certainly needs some resuscitation, for the exports last month showed a marked decline, and gave undoubted tokens of weakness so far as the foreign market is concerned. On the other hand, there would appear to be an improved home demand.

Coming now to prices, the whole situation points to slight reductions. The market altogether is easier. Lincolnshire iron, which competes with northern irons in both the Midland and northern markets, has been reduced another 1 shilling to 53 shillings 7 pence. Other makes are nominally unaltered, but quotations are as easy as they have been for some time past. Purchases of unmarked bars continue to run in very small lines, but the aggregate makes substantial weight and mills keep going. It is expected that should Cleveland warrants remain in the neighborhood of 46 shillings, furnaces will be blown out. If this be so then it follows that lower prices can hardly be looked for in the near future. In finished material the market prices remain fairly firm. Prices to-day are as follows:

Pig Iron: Scotch warrants, 51 shillings 7½ pence; Middlesbrough, 45 shillings 9½ pence; hematite (W. C.), 57 shillings 3 pence. Forge qualities: Staffordshire cinder, 49 to 50 shillings; part-mine, 50 to 51 shillings; all-mine, 57 shillings 6 pence to 67 shillings 6 pence; best ditto, 80 to 85 shillings; cold blast, 95 to 100 shillings; Northamptonshire, 48 to 50 shillings; Derbyshire, 50 shillings 6 pence to 51 shillings 6 pence; North Staffordshire, 51 to 52 shillings; Lincolnshire, 53 shillings 7 pence.

Public stores stocks, May 15:	Tons.
Connal's, at Glasgow	16,758
Connal's, at Middlesbrough, hematite	300
Connal's, at Middlesbrough, May 14	142,098
Hematite (West Coast)	26,185

Finished Iron: Marked bars, £8 10s.; Earl of Dudley's brand, £9 2s. 6d.; second grade, £7 10s.; common unmarked bars, £6 5s. to £6 10s.; North Staffordshire bars, £6 15s.; angles, £6 15s. to £7; sheets, singles, £7 7s. 6d. to £7 10s.; doubles, £7 10s. to £7 12s. 6d.; trebles, £8 2s. 6d. to £8 5s.; galvanized corrugated sheets, f.o.b. Liverpool, £11 10s.; hoop iron, £7 5s.; nail rod and rivet iron, £7 5s. to £7 10s.; gas strip, £6 12s. 6d. to £6 16s.

Steel: Bessemer billets, £4 15s. to £5; Siemens billets, £4 17s. 6d. to £5 2s. 6d.; mild steel bars, £6 12s. 6d. to £7 2s. 6d.; steel plates, £6 5s. to £7; steel girders, £6 to £6 5s.; steel angles, £5 15s. to £6 7s. 6d.

A noticeable feature of the present situation is the small stock of pig iron. In days gone by the stocks, as a whole, have reached a million and a half tons. Half a million tons would now appear to be an ample margin. At the end of 1902 the total stocks in the three principal districts—the only ones that keep public stores—was under 230,000 tons.

Leading British Metal Exports to America in April.

	Tons.
Copper, unwrought	310
Old iron and steel	5,145
Pig iron: London	700
Liverpool	7,699
Glasgow	3,535
Manchester	295
Hull	3,135
Barrow	3,579
Hartlepool	3,640
Middlesbrough	9,681
South Shields	1,250
Swansea	76
Leith	500
Dublin	750
Total	34,840
Iron bars	513
Iron rods	154
Rails	1,200
Wire	437
Galvanized and corrugated sheets	56
Iron and steel manufactures, unenumerated	118
Steel billets	987
Steel bars, shapes and sections	1,857
Black plates for tinning	122
Tinned plates and sheets	3,994
Sheets and plates	579
Hoops and strips	10
Tires	99
Pig lead	75

The North of Spain Ore Trade.

According to official returns the following quantities of iron ore were raised in Bilbao during 1902:

	Tons.
Rubio	4,182,500
Carbonato	442,237
Campanil	57,081
Total	4,681,818

The amount exported is returned at 4,196,851 tons, being 140,150 tons more than in 1901; 84,107 tons were also sent to different parts of the coast.

The fact that forward contracts are no longer made in the autumn has been attributed by some very competent authorities to the state of the home iron trade, but while it may be unsafe to forecast the action of mine owners under the temptation of higher prices, observers are not wanting who consider that the actual hand to mouth system will be maintained in future, as owners of ore will prefer to wait upon the market instead of tying themselves for long periods ahead and locking up a portion of their capital by keeping their stores filled as in former times.

Destination of Iron Ore Shipped.

The iron ore exported from Bilbao during the last two years to various countries was as follows:

Destination.	1901. Tons.	1902 Tons.
United Kingdom	2,281,198	2,996,908
Netherlands	651,473	672,368
Germany	636,509	57,688
Belgium	193,372	224,570
France	196,072	199,305
Italy	.....	14
United States	90,565	45,998
Canada	7,512	.....
Totals	4,056,701	4,196,851

Nearly all the ore sent to the Netherlands and a part of that shipped to Belgium is destined for consumption in Germany.

Prices of Iron Ore.

Prices per ton of iron ore f.o.b. Bilbao in 1902 ruled as follows:

	s. d.	s. d.
Carbonato, first quality	10 9	to 12 3
Second quality	9 0	to 11 2
Rubio, first quality	10 8	to 11 2
Second quality	8 3	to 10 6
Campanil, first quality	11 0	to 11 3
Second quality	9 6	to 10 8

Freights for Iron Ore.

Rates of freight per ton of ore from Bilbao to British ports in 1902 were:

	Highest. s. d.	Lowest. s. d.	Average. s. d.
Cardiff	4 3	3 10½	4 1½
Newport	4 4½	4 0	4 2½
Barrow	5 6	4 10½	5 2
Middlesbrough	5 3	4 7½	5 0
Glasgow	5 4½	5 0	5 2½

British Ships to Foreign Purchasers.

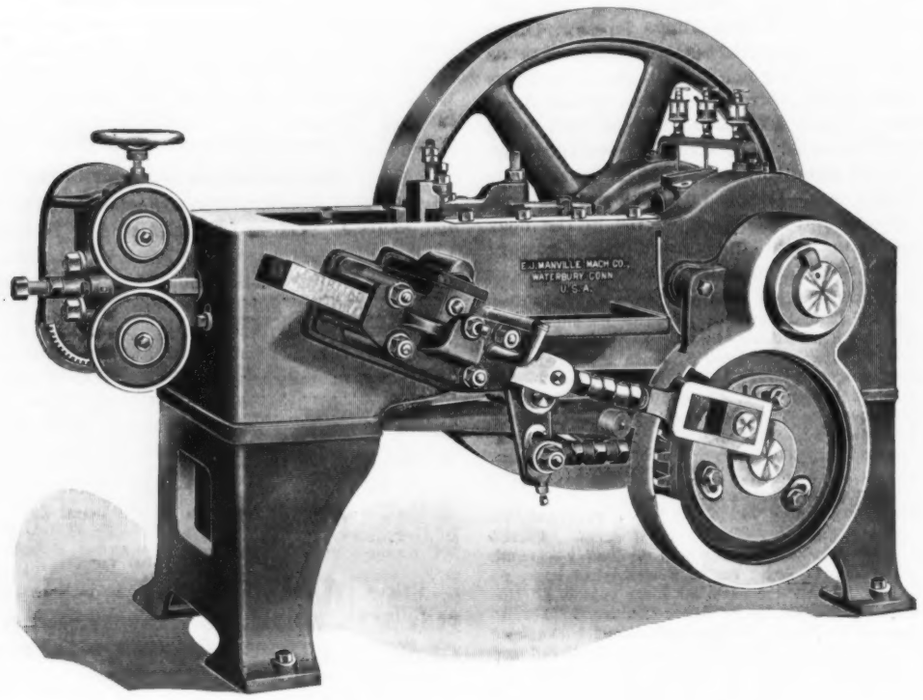
Following is a list of British ships sold to foreign purchasers for the month of April, together with ship's name, port at which built, destination and gross tonnage:

"Batavier VI," Glasgow, Rotterdam	1,180.61
"Bosphorus No. 48," Glasgow, Constantinople	113.75
"Bosphorus No. 49," Glasgow, Constantinople	297.58
"Bosphorus No. 50," Glasgow, Constantinople	298.21
"Camille," Stockton, Caen	1,095.3
"Estonia," West Hartlepool, Copenhagen	1,934.0
"Franconia," Howton-on-Tyne, Trieste	4,255.73
"Grangesburg," Sunderland, Rotterdam	6,571.72
"H. M. Pellatt," Port Glasgow, Canada	1,591.50
"Kathleen Anderson," Aberdeen, Port Natal	218.94
"Leo," Middlesbrough, Helsingfors	2,082.90
"Olinda," Port Glasgow, Cape Town	1,913.98
"Susie," Goole, Sweden	974.48
"Wacondah," Port Glasgow, Canada	1,554.36
"Waterland," Newcastle, Rotterdam	485.51

S. G. H.

The Manville Cold Heading Machine for Bolt Blanks.

There are to-day many products made by cold pressing or swaging metal which but a few years ago were not deemed practical, and this is no doubt due to the combined effort of the machine builders and metallurgists, the former solving the mechanical problems only to find that the physical properties of the metal made their dream of success impossible of realization. A mutual dependence has inspired new efforts on the part of the makers of metal to meet the demand of the machine, until it seems only necessary now to ask and have. So much for material, but the innumerable uses to which it is put call for combined skill and experience on the part of modern machine designers to make successful machinery even for so simple an article as a rivet. It now being possible to get soft iron and steel wire of great malleability, improvements in cold heading machinery have been very marked of late years, and we illustrate herewith one of the latest heading machines from the works of the E. J. Manville Machine Company of Waterbury, Conn. This is the largest at present made by this company and is rated to make blanks up to 3 inches long under the head of ⅜-inch wire—a conservative estimate, however, since in practice they have cut ½-inch and even larger wire.



THE MANVILLE COLD HEADING MACHINE FOR BOLT BLANKS.

As a radical departure from the common form of double stroke headers, toggles have been dispensed with, and in their stead is used a plain crank shaft and connections of ample proportions with large wearing surfaces to actuate the punch carrying gate. Two revolutions of the fly wheel are utilized for each rivet produced, the first being used to gather and center the material, and the second to finish or swage it to exact shape. It is apparent, therefore, that more effective work can be done when the velocity of the fly wheel is double what it would be in the old style toggle machine, since in the latter the wheel not only runs slower (one revolution to each blank made), but energy is taken out of it twice during its revolution. In practice the advantage of the crank action is very marked, as it permits a more compact construction and gives a much higher speed without undue vibration. There is also a decided gain in heading power for machines of given weight, since by getting a rigid frame work and heavy shaft very little of the energy stored in the wheel is wasted in stretching or distorting the frame before doing the actual work of heading.

This design makes it necessary that a secondary or single revolution cam shaft, geared from the crank shaft, shall be used, and from this are operated the feeding rolls, cut off, punch shifter and knock out, and the action of the combined mechanisms during each revolution of the crank shaft is as follows:

Wire is passed between the grooved feed rolls, by which it is forced through the bed and against the adjustable stop, which will regulate the length of the blank to be cut, the feed rolls being revolved intermittently by means of an adjustable crank on the end of the cam shaft. Then the cutting slide, actuated by a fixed crank on the face of the lower gear, is forced to act and performs the double mission of severing the blank and carrying it over in front of the reciprocating heading punches carried by the gate. There being two of these punches, which are to act alternately on the wire to form a head, they are attached to a slide which moves vertically on the end of the gate, and are shifted up or down by a cam on the back of the lower gear, the shifting being accomplished each time the gate reaches the back end of its stroke. Here also has been introduced a valuable improvement, that of locking the punch carrying slide solidly to the gate, in either the up or down position, after the shift has taken place and before each blow is struck. This is so designed that it automatically adjusts itself and need not be considered by the operator when for any reason he chooses to regulate the stop screws which determine the exact vertical position of either punch.

As to the construction and adjustment of the gate, it should be explained that the vertically moving punch block is arranged to adjust sideways, it being carried by a head piece which is clamped to the gate by two bolts and held between adjusting screws. The main connection which joins the gate to the crank is coupled to the gate by an adjustable joint block, between which and the gate is placed a vertically movable wedge, by which the gate may be lengthened to bring more or less pressure on the rivet head.

Provision is made in the cut off connection to prevent breakage, that of a slip joint which when overstrained will cut off a wire pin and allow the block to play back and forth in the slot, thus relieving the great strain which would otherwise come on the cutting mechanism.

In using these machines for certain classes of plow bolts and others which have some irregular shape just below the head it is frequently found advantageous after striking the first blow to withdraw the knock out pin a short distance and then strike the second blow, which drives the blank further into the die, a process which materially improves the shape of the product. To accomplish this requires a specially constructed feed bracket, which contains also this relief motion. Such a device can be furnished with these headers when required. Five sizes of this double stroke machine are made, this being the largest, the smallest being limited to 5-32 inch diameter and 1 inch length.

The American Foundrymen's Association.

Dr. Richard Moldenke, secretary of the American Foundrymen's Association, has issued circulars of instruction relative to the convention to be held by that body in Milwaukee, Wis., June 9, 10 and 11. Reduced rates have been granted by the railroads on the certificate plan of one fare and one-third for the round trip. Certificates will be valid for returning until June 15. The New England delegation will travel in a special car, leaving Boston on Sunday, June 7, at 2 p.m., arriving at Albany at 7.30, where connection will be made with the New York Central train leaving New York City at 4. The suggestion is made that Eastern members endeavor to travel by this train, thus insuring congenial company. The Hotel Pfister has been selected as headquarters in Milwaukee. It is conducted on both the European and American plan. Ample provision will be made for the comfort of visiting ladies, a special committee of Milwaukee ladies having been formed for that purpose. They will be entertained with drives around the city and opportunities to visit all points of interest.

The provisional programme of the convention is as follows:

Tuesday Morning Session.

This will open very promptly at 10 o'clock, the amount of work to be disposed of making this absolutely necessary.

Addresses of welcome and responses.

Address of the president.

Report of the secretary.

Report of the treasurer.

Report of the Auditing Committee.

Report of the Committee on the Standardizing Bureau.

Report of the Committee on Standard Methods of Determining the Constituents of Cast Iron.

Report of the Committee on Sampling Cast Iron.

Report of the Committee on the Proper Valuation of Pig Iron for Foundry Purposes.

Report of the Committee on Insuring Patterns.

Report of the Committee on the Foundry Trade School.

Tuesday Afternoon Session.

This will open promptly at 2 o'clock.

Address by Jos. Leon Gobeille, president of the Gobeille Pattern Company, Cleveland, Ohio, on "The Organization, Maintenance and Management of a Modern Pattern Shop." This will be a very practical talk on the subject of the pattern business. Sketches, drawings and photographs will be shown, and Mr. Gobeille has kindly consented to answer any fair question in connection with the subject in the discussion.

The session will then organize into the Foremen's Section of the association, and the following papers are scheduled:

"A Simple Device for Ascertaining the Average Silicon in an Iron Mixture," by A. W. Walker, Boston, Mass.

"Foundry Control," by R. P. Cunningham, Holyoke, Mass.

"Foundry Management," by David Spence, Chicago, Ill.

"Permanent Molds," by Jas. A. Murphy, Erie, Pa.

"Note on Continuous Molding," by Edward Richelieu, South Tacoma, Wash.

"Molding Machines," by Edward Gilmour, Peoria, Ill.

In addition to the discussions on the above matters, it has been requested that the question of the disposal of waste coke, which is an item in large establishments, be taken up.

Tuesday Evening Session.

This will open promptly at 8 o'clock.

"Retort Oven Coke for Foundry Use," by Wm. J. Keep, Detroit, Mich.

"Note on Estimating Methods," by Wm. Hanson, Philadelphia, Pa.

"The Molding Machine" (continued), by S. H. Stupakoff, Pittsburgh, Pa.

"Malleable Cast Iron," by Dr. Richard Moldenke, New York.

"Employer and Employee," by S. H. Stupakoff, Pittsburgh, Pa.

An address by S. S. Knight, manager Birmingham Pipe & Casting Company, Birmingham, Ala., on "The Principal Factors of the Iron Industry in the Birmingham District." This will be illustrated with lantern slides specially prepared for the lecture.

Wednesday Morning Session.

This will open promptly at 10 o'clock.

The session will be devoted to the proceedings of the metallurgical section of the association, all members of the association, however, being asked to participate.

"The Metallurgical Engineer in the Foundry," by Henry Souther, Hartford, Conn.

"Loss of Sulphur in Borings of Cast Iron," by W. E. Dickson, Sharpsville, Pa.

"Notes on the Microstructure of Cast Iron," by Percy Longmuir, Sheffield, England.

"Blast Furnace Conditions Affecting the Chemical Condition of Foundry Iron," by W. Walley Davis, Roanoke, Va.

"Buying Pig Iron on Specification," by Herbert E. Field, Ansonia, Conn.

"Discussion on the Methods for Determining the Constituents of Cast Iron," as already compiled by the secretary of the metallurgical section, H. E. Field.

"Discussion on the Recovery of Nickel from Scrap Anodes Used in the Nickel Plating Process," by request made at the Boston convention.

Wednesday Afternoon.

Trolley ride to West Allis, visiting the new plants of the Allis-Chalmers Company. Returning by way of the Soldiers' Home, and arriving at Hotel Pfister at about 6 o'clock.

Wednesday Evening.

Theater party.

Thursday Morning Session.

This will begin promptly at 10 o'clock.

Unfinished business.

New business.

Election of officers.

Adjournment.

Thursday Afternoon.

Trolley ride to the parks, breweries and other points of interest, returning to Hotel Pfister at about 6 o'clock.

Thursday Evening.

A smoker at Hotel Pfister. Music by the Lyric Glee Club. Addresses by prominent speakers.

A creditor's petition in bankruptcy has been filed against the Compressed Air Company of New York by several creditors of Chicago, the claims aggregating $3100. All these are on notes now overdue, and partially secured by the bonds of the Rome Locomotive & Machine Works of Rome, N. Y. The company are capitalized at $8,000,000, and succeeded the American Air Power Company of New York, and the Compressed Air Motor Company of Chicago. Two years ago they obtained control of the Rome Locomotive Works by purchase of the entire capital stock.

The Dauphin County Court has decided that the American Steel & Wire Company of New Jersey are not liable for bonus tax upon capital stock employed in Pennsylvania prior to the act of May 8, 1901.

The Talbot Process Discussed.

At the recent meeting of the Iron and Steel Institute there was an interesting discussion of the paper by Benjamin Talbot of Leeds on "The Development of the Continuous Open Hearth Process." We print the following abstracts from a report of it in the columns of the London *Ironmonger:*

Edwin Martin (Carnegie Steel Company) said in looking over the paper there were several things that were very interesting, and he noted that the first was with reference to the operations of the Jones & Laughlin furnace. He had a little data with regard to the work of that furnace. They had troubles to start with, and there were always difficulties to which every one was liable, of course. But from the results produced so far he could not see why it was necessary to put up such expensive furnaces. He was told before leaving America that the product of the Jones & Laughlin furnace was 98 per cent., and they were running from 1200 to 1400 tons per week. Now with the ordinary process as practiced at the Homestead Steel Works, Pittsburgh, the furnaces would give about 650 tons. The size of the furnace they would naturally suppose would be taken at the cost rather than the measurement. They might have a very expensive small furnace and one not so expensive large in area. Even then the 1400 tons (the maximum output of the Jones & Laughlin's) was not any more than the two smaller ones of the Homestead Works. The one furnace which produced this continuous metal would cost between $400,000 and $500,000—at least those were the figures they were told in Pittsburgh—whereas the ordinary small furnace, he presumed, could be put up at a cost of not over $100,000 for the full equipment; so that they were paying rather a large amount for the continuous method. When they first started out the object of the continuous process was to get frequent heats and small ones, the idea being that they could have a tremendously large furnace, with small cranes to handle small quantities, rather than the expensive machinery necessary to handle 40 tons or more. But now the large continuous furnaces were producing 40 tons, and this was the objection first made to running the ordinary furnaces in such large quantities, as it made too much steel to send to the mills at one time without having a very extensive soaking pit arrangement, or some other arrangement for heating the same. The cost of the two furnaces would show, probably, that the continuous would be very much more expensive than the ordinary pig and ore, regarded as an investment.

The Cost of Repairs.

The cost of repairs connected with the Talbot furnace, which was under their jurisdiction at Homestead, showed for repair 58 3-10 cents per ton, as compared with 34 cents for the ordinary pig and ore, and that the furnace at Pencoyd, since February 6, 1901, to May 7, 1902, had only averaged 54.85 days in use. The cost of refractory lining for the Talbot furnace was 0.169 cent per ton, as compared with 0.10 cent for the ordinary pig and ore. So far there had been nothing gained to the advantage of the continuous process in actual cost of running. In reading the discussion on the first paper presented by Mr. Talbot to the Institute, one speaker gave as his reason for putting in the furnace that it was the small heats and frequent that they were after, as by doing this they could still have a large furnace, with their small cranes to operate the same. Consequently it was at a very much cheaper cost for the original outfit, as they had the advantages of a large furnace and the quantities that could be taken out. In taking out 40 tons at a time they were going away from the original idea of having small heats and often, but they were doing exactly the same as the ordinary pig and ore furnace, tapping 40 tons. In the pig and ore practice, as used at Homestead, they got a yield of 97.76 ingots, 3.31 of scrap, showing a gain of 1.07. He should like to know why the change was made from 20 to 40 tons, when one of the claims of the process was the advantage it possessed in being able to give small quantities and often, resembling, in fact, the quantity given by the Bessemer process. Jones & Laughlin had considerable trouble with the furnace, but he had heard that their trouble with the mechanical parts of the furnace was very much reduced. The Pencoyd records showed that the tonnage from the Talbot furnace was from 4000 to 5000 tons, as against 7500 to 8500 tons from the ordinary furnace, and the cost of repairs in the Talbot continuous was $2400, as against $1700 for the ordinary furnace, showing nearly double the output and less than two-thirds of the cost of the Talbot for repairs for the ordinary. Therefore he would like to ask why they should change to the continuous process when the results given in the ordinary practice showed better. It might be added that the Jones & Laughlin Company were using nothing but Bessemer metal in this furnace, and therefore they did not have the trouble with the slags that they would have were they using highly phosphoric iron.

A Slag Process.

Percy C. Gilchrist (London) said the results given by Mr. Talbot in his paper showed conclusively that his method was one that was especially advantageous to the basic process. The basic process was really a slag process, and when they let the steel off at every charge they had the slag on the bottom. He should like to ask Mr. Talbot whether he could give the amount for basic material, both when magnesite and dolomite was used, and also whether he had been able to try the addition of molten basic material. He would also like to ask whether Mr. Talbot had ever tried to get this mixture by taking out 10 tons of metal and pouring it in again so as to pass it through the slag.

A Comparative Table.

E. H. Saniter (Middlesbrough) said that after reading Mr. Talbot's interesting paper, it naturally occurred to him to compare the results obtained by the three different qualities of iron, of which the working results were given, to arrive at some idea of what results might be expected from more pure or impure irons. He had compared the results of different furnaces working on different time with a view to forming some idea of the output in the working of the pure ores. With a view of comparison he had constructed the following table:

		Week's Make per square foot of area.		Analysis of metal.			
Location.	Surface area. Sq. ft.	Make ingots and scrap. Tons.	Tons.	Sili-con.	Sul-phur.	Phos-phorus.	Yield.
Pencoyd	270	650	2.4	1.0	0.06	0.9	106
Jones & Laughlin	640	1,415	2.21	1.2	0.06	0.1	100.74
Frodingham	400	624	1.56	1.0	0.06	1.8	104.8

In looking at this table it must be remembered that to make the Frodingham week equal to Jones & Laughlin's, one day must be added, making the tons per square foot 1.82. What struck him in this comparison was that when using hematite both the output and the yield were inferior to that obtained on metal containing 0.9 phosphorus at Pencoyd, when one would naturally expect that at any rate the output would be considerably more. It would therefore appear that hematite was not the most economical. Then looking at the Frodingham results, they found the output was materially decreased, both as compared with Pencoyd and hematite iron. This greatly lower output, equal to 20 to 25 per cent. less than Pencoyd, was attributed by Mr. Talbot to increased impurities—that is to say, an extra 0.9 per cent. prosphorus, as compared with Pencoyd iron. That question of how far increased impurities would affect the make was very important, and he would like to ask Mr. Talbot if he had any idea how much further the output, as compared with Frodingham, would be reduced by using lean Cleveland iron, containing 1 per cent. silicon, 0.2 per cent. sulphur, 1.5 per cent. phosphorus, or ordinary basic iron containing up to 3 per cent. of phosphorus.

The Output of Furnaces.

In considering the output of these furnaces it would appear as if 34 charges were about as many as could be got in a week, allowing time for all the necessary operations connected with each pouring, and it would therefore appear that in order to get increased make larger charges would have to be poured. The lurid picture Mr. Talbot drew of the difficulties of working molten metal in fixed

furnaces would certainly frighten him had he not had some slight experience of what the difficulties were. In this connection it might also be pointed out that both the high yield and evolution of CO were obtained in working molten metal in fixed furnaces in the ordinary way. It was true that the CO was not given off so rapidly in the fixed furnace, by which reason it was burnt more efficiently in the furnace instead of largely in the checkers. In this and the previous paper there were numerous analyses of the steel made at Pencoyd and at Jones & Laughlin's, but the paper was without any information with reference to the steel made at Frodingham from British iron. If the analyses of the steel made during the two weeks given could be added, it would materially increase the interest of the paper. The columns of carbons "wanted" and "obtained" were of great interest both with reference to this case and also on general grounds. In reference to Mr. Talbot's remarks about sulphur, he might say that moderate amounts of sulphur could be removed in fixed basic furnaces without delaying the process, and, further, that it could be done more economically and with greater regularity and certainty than by the use of manganese either in the blast furnace or the mixer.

F. W. Paul (Tamworth) said that during his visit to the United States last year he had the pleasure of seeing at Jones & Laughlin's the 200-ton furnace plant for the Talbot process. With reference to the author's opening remark as to the same hearth at Pencoyd being at work for three and a half years, he thought that was a feature of the process which conveyed in practical language the possibilities of increased output by reason of the absence of delays which took place in ordinary basic practice, with holes occurring in the bottom and banks, even when the bottoms were renewed at intervals of one to two years. The author had also said, "The furnace is supplied with natural gas, which is one of the advantages of the Pittsburgh district." He would like to ask what special advantages he referred to. Were they such that by substituting producer gas the Talbot process would not be as effectively worked? Mr. Talbot also said that "owing to the wet state of the scale the oxides added were purposely limited, so that the yield is not so good." He though it would be agreed that the moisture on its conversion into steam when the scale was put into the bath of the furnace would be effective in oxidizing part of the carbon, which would account for lower yield, but in so far as the extent to which oxidation was effected in this manner the consumption of scale would be less, and any further additions to what was used would have been unnecessary. The information conveyed about the use of scrap was particularly interesting, for hitherto the consensus of opinion was that the Talbot process did not lend itself to using up scrap. The plunging of scrap into a bath of molten steel combined the advantage of preventing its taking up sulphur when exposed for some time to producer gas during melting. There would appear to be some slight misunderstanding as to the exact interpretation of the thermal chemical change in the oxidation of carbon by oxide of iron as represented by the formula, $Fe_2O_3 + 4C = 4CO + 3Fe$. That this was an end of thermic reaction was evidently appreciated by the author, for earlier he had said: "The temperature of the bath is lowered by the dissociation of the iron oxides introduced." In the Bessemer process, in which carbon was eliminated as carbonic oxide, there was an increase of heat imparted to the charge in the vessel, and in the Tropenas process, as pointed out by Mr. Campbell, when the carbonic oxide was burnt to carbonic acid by the upper row of tuyeres, there was more heat available to be taken up by the steel.

Silicon Elimination.

Perhaps it might meet Mr. Talbot's and Mr. Campbell's views were it stated that while realizing the endothermic reaction in either a quick or slow reaction between carbon and oxide of iron, that by reason of its rapidity the Talbot process resulted in copious stream of carbonic oxide in such quantity as to permit of shutting off the producer gas and allowing air only to enter the furnace so as to burn the carbonic oxide to carbonic acid. Was it not, therefore, a justifiable claim that this resulting heat materially assisted in maintaining the heat of the furnace, whereas in slow reaction, such as took place in ordinary open hearth practice, the resulting heat of carbonic oxide to carbonic acid was dissipated by radiation? He would, in conclusion, with their permission, refer to the author's remarks on the difference in practice between the Talbot process and ordinary preheated oxide of iron process. Mr. Talbot said that "while the slag is in a foamy mass the removal of the carbon is slow, owing to the insulating action of the thick layer of slag upon the surface of the bath." He would humbly beg to differ from the author as to this explanation, although he was at one with him as to his description of the actual foaming. He would venture to suggest that the crux of the question of the success of the Talbot process, both as regarded yield and output, was in a great measure due to the very ingenious manner in which the author overcame the great stumbling block of silicon elimination—viz., that of adding about 10 per cent. of molten pig iron, containing about 1 per cent. of silicon, to a bath of molten steel containing no silicon. In his (the speaker's) presidential address to the West of Scotland Iron and Steel Institute in 1897 he referred to the difficulty in the removal of silicon in the open hearth process as follows:

> The oxidation of silicon by ore additions in an open hearth furnace is one which opens up a field of most interesting investigation, and in view of the tendency of increasing the capacity of melting furnaces demands our early study. The further increase in size of furnaces will, I think, in great measure be dependent on this part of the process. The greater relative affinity of silicon at low temperature for oxygen as compared with carbon and iron is clearly exemplified in Sir J. Lothian Bell's "purifying process," which resulted in elimination of silicon, while the carbon and iron are barely affected. On the other hand, in the Bessemer process, if the metal is allowed to blow very hot the temperature so far increases that the affinity of silicon and oxygen is less than that of carbon and iron; hence the reason for the practice of cooling down the metal in the Bessemer vessel by addition of cold scrap. I am of opinion that the most objectionable feature of the open hearth process is the elimination of silicon, because its affinity for oxygen is dependent on the temperature of the metal.
>
> It is this one feature of the process that I fear will cause practical difficulties in dealing successfully with 100-ton furnaces. When the charge is too hot the molten metal froths up through the slag and is exposed to the oxidizing atmosphere of the furnace, resulting in the oxidation of metallic iron. The wasted iron is carried along with the products of combustion in the form of red fumes, as in the after-blow of a basic converter. The waste of iron in form of red fumes takes place frequently to the extent of 25 cwt. per hour, so that I am inclined to the opinion that the reduction of oxide of iron by the silicon is frequently more than counterbalanced by the waste of the metallic charge during the elimination of silicon in an acid bath.

Since then these views appeared to have been fully confirmed, for with charges of about 50 tons in ordinary basic working it was usual to overcome silicon troubles, with a view to large outputs, by working charges composed of 50 per cent. molten pig iron and 50 per cent. scrap. As regarded the Talbot process, after the addition of 10 per cent. of molten pig iron, the resulting average composition of the charge was approximately 0.50 per cent. carbon and 0.12 per cent. of silicon, which he thought most would agree was an ideal composition to commence boiling operations, and it resulted in the whole mass coming on what might be termed a natural vigorous boil without undue foaming, with its accompanying loss of metallic iron, or scarification of the banks of the furnace. There had been numerous special commissions to America to ascertain wherein their methods differed from English, and to the valuable reports already issued he thought they might succinctly add that whereas in this country they muddled through the inevitable troubles of high silicon with poor outputs and yields, the Americans appreciated its importance by making low silicon iron and by still further mixing the molten metal with 50 per cent. of scrap. He submitted that on the theoretical reasons adduced and the evidence of actual work accomplished they might with confidence say the Talbot process had come to stay.

George Ainsworth (Consett) said they were told that they were not to accept one or two weeks' work as the result of a process, but as he was concerned on behalf of the Ingot Makers' Association in dealing with the wages of the Steel Smelters' Association for the Frodingham furnace, he had put before him officially the results for

a series of weeks and for several months, and it was only fair to Mr. Talbot to say that the weeks that he produced might be taken as fair average weeks. He might have picked out better ones, but the average yields of the months that he himself had got was a little less than Mr. Talbot had given for the two weeks. But the difference was so small that Mr. Talbot might be regarded as having fairly obtained what they were doing at Frodingham.

Increased Value of Slag.

Professor Turner (Birmingham) said that all of them interested in the metallurgy of steel were anxious about the Talbot process, and they were very much indebted to the author for bringing the additional information before them that day. He congratulated Mr. Talbot on the considerable measure of success that had been already obtained. He would like to say a word with reference to the composition of the slag obtained. Hitherto the difficulty was that the slag was of no value and could not be dealt with under the ordinary basic process. But he was glad to see that they had now a slag producing over 16½ per cent. of phosphoric acid, and therefore a slag which he presumed would be of considerable value for agricultural purposes.

The Question of Cost.

F. W. Harbord said with reference to Mr. Martin's remarks about the furnace producing 600 tons, as against 1200 to 1400 tons of the Talbot process, it practically meant this, that the output in the Talbot was double in the same size furnace working under the ordinary condition. Against that was the question of cost, and it became a question of cost whether the amount of labor employed did not soon pay for the extra cost of the process. He was only once at Frodingham, but being particularly interested in the process, he was delighted to see the ease with which the furnace was manipulated and the small number of men about. The whole thing was conducted in such a way that labor must have been reduced to a very small charge indeed. With reference to the 40-ton charges being made, he took it that this was a matter of experience largely. It might be that they might have to fall back upon 40-ton charges, but the matter must be thoroughly threshed out. One great point about the Talbot process was that they might be able to deal with the hematite iron just outside hematite limit in the basic furnace. The basic process had always been disappointing to him in so far as it was not developed on this line. They had never largely worked hematite iron in a basic furnace, and he looked forward to the Talbot furnace for doing this. It was well known to all members that there was a great scarcity of high class hematite ores which were becoming more scarce every day, whereas there were large supplies of ore just outside this limit which would be available by this process.

The Author's Reply.

Mr. Talbot, in reply, said that he would start with Mr. Martin, the metallurgical expert of the Carnegie Steel Company. He must congratulate him on taking such an interest in the furnace at Jones & Laughlin's; he was rather afraid that perhaps it was considered such a dead letter that they would not look into it any more. Of course the difficulties which Mr. Martin had mentioned were entirely mechanical. He should say that a year or more ago he went over to see that furnace, because he had no responsibility in the design at all. Mr. Jones, when he went into this question of the continuous process, said that they considered that they had such a staff in their works that they were able to find the thing out, and they did not care what it cost them, and that had been their policy for the last 20 years. He said: "Very well, Mr. Jones, I do not think you are right, but go ahead.". With reference to Mr. Martin's remarks about the capital cost, all engineers knew that they could spend anything on a plant; of course they knew it in America, particularly in the Carnegie Steel Company. Money was no object at all. When he told them that this furnace was erected on an ash bank which was 50 feet high, and they could not go through it, because if they did they went into the mud of the river, and it had to be erected on arches, so that they could go underneath that immense furnace, like so many caverns, they would understand that it required a little money. They might have spent $400,000, but he would say this, that they need not spend half that money per furnace.

As to the report of the Pencoyd furnace he was rather at a disadvantage, because it now belonged to the trust, and he had not the detailed records. But one point that appealed to him as an outsider was this: Mr. Martin said that the furnace was not a success because certain items were more expensive. As a practical business man he would ask why the trust ran that furnace in its present shape to-day when they could without any expenditure go to the ordinary process, and they could take 60-ton heats out instead of 30 tons. Mr. Gilchrist desired to know about the quantities of magnesite used as compared with dolomite. His experience with magnesite was that if they could get the men to use it economically they might take less, and considering that a good deal of it was thrown into the furnace, they wasted a good deal of an expensive material, and consequently in all tests that he had made magnesite had come out favorably as against dolomite. Mr. Saniter asked him about Cleveland ore with 1 per cent. of silicon and 0.02 of sulphur, with the usual phosphorus. All that he had to say about that was that such metal ought not to go into a steel furnace. The question was whether it would cost more money if they took everything into consideration—it was not the question of the extra time, it was the indirect costs. To run a steel works successfully they must get product, and a process that took ten hours instead of eight hours was a very expensive operation. So that when they were starting it in Middlesbrough with the plant which was going in there, his advice was to get iron low as far as the sulphur was concerned, which would be all right in the steel—he did not propose to spend more money on it than he could help.

Notes from Mexico.

The New Loan.

DURANGO, May 20, 1903.—Mexico's financial affairs have been discussed with interest both at home and abroad during the past few weeks. The visit of the Minister of Finance, Señor Limantour, to New York served to give additional zest to the situation. It was on all sides inferred that the principal object of Señor Limantour's visit to the United States was to discuss the national fiscal system of Mexico, and to feel the way for contemplated action which would result in giving the Mexican dollar greater stability abroad. It was not generally believed that negotiations would be begun at this time, either in New York or in Europe, for a gold loan. If such a step should be taken, the idea among the wise was that the loan would be a special one for a large amount, which would be used for giving the treasury of the nation a gold reserve fund as a preliminary step in the operation of gradually changing the fiscal system of the country from a silver to a gold basis, and not a loan, as it now turns out to be, for the defrayment of the cost of industrial improvements and allied purposes.

It came rather in the way of a surprise that the $12,500,000 gold loan which Señor Limantour negotiated through Speyer & Co. of New York was without bearing upon the national fiscal system. The uses to which the funds are to be put are clearly defined in a statement just made by the Finance Committee of the Chamber of Deputies, in which the explanation is given that the funds are to be expended in meeting the cost of the public works enumerated in the law of June 9, 1902, whereby authority was given the executive "for the issue of securities of the public debt, running for a short or long time," to meet such cost. The items include the following: $5,500,000 for the improvement of the National Tehuantepec Railway, for the exploitation of said railway, and the terminal ports; payment of the sum of $500,000 as the first instalment toward the corporate capital in accordance with the contract between the Government and Pearson & Son, Limited; port works at Salina, Cruz and Coatzacoalcos; Manzanillo port works; buildings and subsidiary works at the port

of Vera Cruz, not exceeding $1,000,000; construction of the wharf at Tampico; construction of the federal legislative palace; piping, elevation and distribution of water in the City of Mexico, "according to the project that may be definitely approved by the ayuntamiento of the capital and the federal executive;" redemption of the bonds issued for the payment of the capital's sanitation works, and to defray the price of the Interoccanic Railway securities, "whose acquisition has been secured by the Government by means of an issue of two-year Treasury bonds bearing 4½ per cent. interest per annum at an issue price of less than 97 per cent."

The Government's Railway Policy.

When submitting to the Chamber of Deputies the draft of the bill empowering the executive to defray the cost of the public works and the securities of the Interoceanic Railway, previously referred to, the President defined the Government's policy with respect to railway corporations and their practice of combining. It may be recalled that it was the talk of a railway merger which induced the Government not long since to step in and buy a controlling interest in the Interoceanic, in order to maintain an independent outlet to the Coast at Vera Cruz. The Executive takes a firm stand in opposition to tactics of the kind indicated. The following frank statement fairly reflects the Government's attitude:

> The President considers that the time has arrived for informing Congress that the Federal Executive has noticed with concern the tendency that has of late been manifested by certain railroad corporations, both within and outside of the republic, either to obtain control of the entire national railway system, or to enter into consolidations and combinations of every kind in order to do away with the effects of competition, which, while curtailing the profits of the corporations in question, enhance to the same extent the benefits conferred by them upon the public; and in order that the latter may enjoy the greatest advantages possible in this matter, the Executive at the commencement of the year mapped out for itself a line of conduct the principal object of which is to strengthen the hand of the proper authorities in the domain of what may be called the railroad politics of the republic.

The purchase of the Interoceanic securities is thus commented upon:

> The most urgent step toward the realization of the policy adopted in this respect was undoubtedly to prevent one of the two great railways uniting this capital with the country's chief port from being included in one of the combinations alluded to.

A fuller elucidation of the Executive's views upon this subject is promised in a special note hereafter.

Market for Roofing Material.

There would be a good market in Mexico, if it were properly cultivated, for all kinds of roofing material. With the exception of the modern buildings in two or three of the largest cities, leaky roofs are the rule. There are comparatively few houses in this city whose roofs would withstand a 12-hour downpour in the rainy season and afford no evidence of water dripping down the walls inside the living rooms. Roofs are generally constructed over adobe buildings in a very defective way. Common "shakes" are laid across huge roof beams, or "vigas," making a flat covering, upon which is laid earth from 1 to 3 feet deep. This earth is capped with small earthen tiles. No patent roofing material of any kind is used to make the roof water tight. Between the seams of the tiles the heavy rains soon find a way, softening the earth and rotting the "shakes." After heavy rains, not infrequently half a wheelbarrow load of the earth covering falls within the rooms beneath with the proverbial "dull thud" of journalistic usage. Terne plate, galvanized and corrugated roofing, as well as roofing felt and the other patent materials common in the United States, ought to find a market here if pushed in a systematic way and recommended by architects. The costly new opera house in this city has been roofed by a St. Louis firm who obtained the contract for the cornice work, roofing and the interior metal ceiling. The work has been in hand for a year, and it will soon be completed. It ought to prove a good advertisement for tin roofing in this district and induce builders of the better class of houses, at least, to improve upon the defective system now in vogue. It is suggested that manufacturers of the cheaper kinds of roofing materials open up correspondence with supply houses in the principal cities of Mexico with a view to the introduction and sale of their specialties. If descriptive reading matter is sent out it should, of course, be in the Spanish language.

Helpful Suggestions.

As addenda to the foregoing, and for the benefit of contractors in the United States who have work to do in Mexico, and others who expect to obtain contracts for construction work, and are not familiar with the local conditions in the places where the labor is to be done, a few suggestions which may be useful are offered.

Before shipping workmen, tools, or materials to the scene of operations, the contractor should make it his business to ascertain, from some trustworthy person upon the ground, exactly what the conditions are in regard to native help, raw material, if such is needed, and tools. This will save a good deal of trouble and expense, and possibly considerable time in the preliminary operations incidental to making a start. More than one instance has come to knowledge wherein contractors failed to send with their men simple but necessary tools, under a mistaken impression that the latter could be obtained upon the spot, or that they were being used by workmen following callings similar to that of the contractor interested, in the town where the work was to be executed. The same caution holds good in regard to materials to be used in connection with the undertaking, no matter how insignificant the article may appear from a distance. It can be assumed with safety as a general rule that at all points outside of the principal cities in Mexico there is a scarcity, if not an actual lack, of skilled labor, of tools for special classes of work, and of materials, except the raw staples. Nothing should be taken for granted, and nothing left behind unless the omission is justified by absolute knowledge that the want can be supplied from local sources.

Industrial Notes.

The demand continues active for transmission machinery. Mexico City supply houses report that several orders of this character have recently been placed with the Dodge Mfg. Company and with Fayerweather & Ladew of New York City.

Heavy rains have fallen in the Isthmus of Tehuantepec district. There is a scarcity of water in the Northern States and, as yet, no sign of the rainy season's approach.

The city of San Luis Potosi is endeavoring to secure the construction of a system of electric street railways. The local electric light company is desirous of co-operating with individuals interested in establishing such system.

Quintana Roo is the name of a new Mexican Territory formed some time ago, which comprises a portion of the State of Yucatan. Congress has been asked to exempt from taxes merchandise entering the territory intended for local consumption.

A Mexico City daily reports that orders have been placed with the Bentel & Margedant Company of Hamilton, Ohio, for woodworking machinery for this country.

Connection has at last been made between the Vera Cruz & Pacific Railway and the National Tehuantepec Railway, at the junction point of Santa Lucretia. A regular passenger and freight service is now in operation between Cordoba, V. C., and Isthmus points.

A concern named the San Antonio Pressed Brick Company intend to build a plant at Monterey.

An establishment for the manufacture of Mauser cartridges for the use of the Mexican army is to be built at Chapultepec. The equipment will be of German construction.

A new market is to be built in Torreon. The contractors are MacKenzie & Dillon of Monterey. The edifice will cost about $100,000.

The City Council of the Capital is in the market for a quantity of tubing for artesian wells.

The Department of Justice has officially approved of the typewriter. Typewritten copies of deeds and other legal documents made by notaries are sanctioned, provided that the permanence of the ink used is guaranteed.

It is announced from Tampico that the Pan-American

Asphalt Company will build a plant in the neighborhood of the Tamihua lagoon.

An order for rolling stock has been placed with the American Locomotive Company for the National Tehuantepec Railway.

The coal deposits at Jiquilpan, Michoacan, referred to recently, have been leased for a long term, the lessee undertaking to develop them and to construct a railway in connection therewith.

Among orders recently placed with manufacturers in the United States are the following: Pulsometer Steam Pump Company of New York City, steam pumps for the San Luis Foundry & Machine Company of San Luis Potosi; Geiser Mfg. Company of Waynesboro, Pa., an order for portable engines and other machinery, by Korff, Hornsberg & Co., of the City of Mexico.

The Employment Department of Employers' Association Work.*

BY J. C. HOBART, CINCINNATI.

A correct idea of the importance and scope of this work cannot be obtained without in the first place outlining the conditions calling it into existence. Never in the history of this country has the subject of organized labor received the attention employers have devoted to it during the past year. As a result, employers' associations have rapidly sprung into existence, organized primarily to oppose unjust actions and rulings of organized labor. Constituted as they are of men of broad mind, whose opportunities have in most cases been far greater than those of the constituents of organized labor, it is to be expected that their associations will avoid the mistakes of organized labor, and adopt no policy which they condemn in their opponents.

The Basis of the Formation of Unions

was the desire of the workingman to better his condition, to elevate himself and to educate his family. The necessity for association with his fellows was not felt when the employee worked alongside of his employer, often living in his family. As conditions changed and employers formed partnerships and then corporations leading up to the great combinations of to-day, the employee became further and further removed from his employer and experienced more and more difficulty in obtaining a hearing or securing redress for grievances. He should not be blamed, therefore, for following his employer's example, and combining with his fellows for mutual protection and benefit. The immediate result of this combination taught him the power of organized effort. It is not strange that this sudden acquisition of power by a class totally unused to it resulted in an intoxication leading to many excesses and abuses.

The mere fact, however, that abuses had arisen from lack of proper counsel, from ignorance and from vicious or misguided leadership cannot be assumed as evidence that the original objects were wrong. As a matter of fact, most employers' associations have reiterated these same principles, in slightly different forms, perhaps, but essentially the same—namely, the establishment of fair conditions of employment and the education of the working classes.

It would therefore appear that to this extent employer and employee were organized for the same object. In addition there are many reasons why the employer should be in sympathy with the effort of organized labor to raise wages. Every increment in the earning power of an individual over and above the cost of sustaining life in the manner to which he has been accustomed increases the consumptive power of that individual. This increment may be provided in two ways: 1, By an increase in the remuneration for labor; and, 2, by a decrease in the cost of living; either would produce the same result to the extent that it provided increased consumptive power.

The effort of organized labor has been directed solely toward increasing the remuneration of labor irrespective of increased cost, which, barring competition, would simply increase the selling price of the product and leave the laborer where he was before. The effort of the employer has been to decrease cost of product, which aided by competition would decrease the selling price, enabling the same remuneration for labor to purchase more.

It will be seen, therefore, that the effort of organized labor is directed contrary to the great law of competition, whereas that of the employer is in accordance with it. This but emphasizes the fact that the two great forces, organized labor and organized employers, having the same objects and interests at the bottom, have diverged merely on the means by which these objects are to be secured.

Employer Should Pay Highest Wages Possible.

It is undeniably to the interest of the employer to pay his employees the highest wages possible up to the limit at which he can no longer dispose of his output at a profit, simply because the higher the wages the greater the consumptive power of the employee. Education, which is a cardinal principle of both associations, has done much to inculcate the desire in the masses for a higher standard of living and a greater share of the luxuries of this world, and has been largely responsible for increasing the amount of wealth consumed by the working classes.

The education of the working classes has been largely one sided, resulting in the demand by them for increase of wages and reduction of hours of labor, as a necessary means for securing and enjoying these advantages, the demand being limited only by their poyer to enforce it through the medium of their union and entirely irrespective of any economic conditions.

This, then, is the dividing point. That labor unions have secured advances in wages and shorter hours for the laborer cannot be denied, and these two items are the important things the worker desired and could not get by individual effort. Therefore unions have had rapid growth. So long as this growth was confined to separate localities, or rather so long as the unions in different localities acted independently of each other, employers were apathetic or indifferent.

Nationalization of Unions.

During the last few years, however, the various local unions have formed national organizations, and these different nationals have affiliated into the American Federation of Labor. This movement has enabled organized labor to exert a tremendous influence on the commercial interests of the nation. It has, moreover, invested with a great amount of power men who by natural endowment or education are totally unfit to properly wield it. The result has been the abuse of this power, threatening the continued prosperity of the country and even the permanence of its free institutions.

Employers have at last recognized the danger, and are, in turn, rapidly organizing, but this movement is only in its infancy, and we are yet searching for the proper means of securing the results we all desire—namely, the reign of justice and peace.

The census of 1900 showed that there were 29,000,000 wage earners in this country, constituting what is usually called our working classes. Analyzing these figures, Carroll D. Wright said in the *North American Review* last year: "Only one-quarter of these are organizable industries, or 7,250,000, and if one-fifth of these are in labor unions that would place the strength of the unions at 1,500,000," which closely agreed with the estimate at that time. The figure assumed to be correct to-day places this number at 2,000,000. Even at this figure, it is seen that the members of unions are less than one-third of the workers in organizable industries and less than one-fourteenth of the total wage earners.

Wherein, therefore, if these figures are true, lies the tremendous strength of organized labor? Partly in the fact of their organization, just as a small force of well drilled troops is superior to a host in the shape of a mob. Partly because in some industries nearly the entire force of workers are members of the unions and through their affiliation with the American Federation of Labor exert their influence on allied industries. But principally be-

* Address at the special convention of representatives of local employers' associations, held in Cincinnati under the auspices of the National Metal Trades Association.

cause organized labor has claimed, and until recently with no denial on the part of the employer or the public press, to represent and stand for the working classes, this overwhelming army of 29,000,000.

This it is that gives organized labor its standing in the halls of Congress and in our State legislatures, and this it is that has influenced the public press. We all know that this is a fallacy—that organized labor not only does not represent the working classes, but on the contrary misrepresents them, but not until recently has any effort been made to demonstrate this either to the working classes or our legislators.

Let me ask you another question: Would the working classes believe you as employers if you said to them "Organized labor misrepresents you; we can and will represent you properly?" In my opinion the answer would be "No." Long years of neglect cannot be forgotten in a moment, and something more than words is required to erase their memory.

Now, what are we going to do about it?

Course of Action for Employers' Associations.

It would certainly seem to me that if the case is correctly stated, and I believe it to be so, the logical course of action for employers' associations is clearly indicated. They should not forget that the fundamental object of their association is the same as that of organized labor. That they are in opposition to organized labor only as to the means adopted for securing the basic objects of both associations, and in so far as organized labor has abused the power invested in it.

They should organize as effectively as is organized labor. Each industry should have its national employers' association, and these in turn should be affiliated. No other logical course is open if anything like equal results are to be obtained. They should bear in mind that the greatest strength of organized labor lies in its supposed backing by the working classes. I say supposed, because this support is based on the belief that organized labor is acting in the interest of humanity, of the cause of the worker, and if this class were convinced to the contrary it would withdraw all support.

The great mass of the working classes are conservative, loyal American citizens, the backbone and sinew of this nation, and they would not support anything contrary to our Constitution or that abridged the freedom conferred on every individual by it. Our greatest effort therefore should be directed toward educating this class to the fact that organized labor is adopting and advocating a policy that would, if followed, react most seriously on the workers.

To approach this subject in a spirit of antagonism is to court failure at the start. To make the excesses, the atrocities and outrages perpetrated by and for organized labor a basis for attack upon labor organizations is worse than useless, because behind those acts is the feeling of the great working classes that there was a high and noble purpose—the cause of humanity. That these excesses, abuses and atrocities should be made known and punished is just and right, and the public would so decide, but the acts of criminals or misguided men must not be assumed to condemn the cause in or for which such acts were committed.

One of the greatest obstacles to be overcome in this work is the inborn suspicion of the workers founded on the belief that it is to the employer's interest to grind them down and make slaves of them and that that would be his course if he had the power. You all know what excellent foundation for this belief history affords, and can well realize the task involved in altering that view, but it must be done, and organization can alone be looked to to accomplish it.

What Organization Must Accomplish.

Now what must organization, I mean organization of employers, accomplish? 1. It must secure for the worker just what he most desires from the union, or, in other words, it must secure for him those results which both labor organizations and employers' associations agree in declaring are their basic objects—namely, higher wages and shorter hours of labor. 2. It must provide means by which employees can reach employers so that they can have their grievances heard without the necessity of joining a union to do so. 3. It must convince the working classes, or rather the public, that it can and will accomplish the purposes for which it claims to be organized. In other words, it must convince the public that it is honest, and if given the power would not grind the worker down, but on the contrary would pay the highest wages and work the shortest hours that economic conditions justified.

It is the idea of the Cincinnati members of the National Metal Trades Association that there is a higher position for their association to fill than has been realized by many, even of our own members. We believe that association has removed much of the jealousy formerly existing between individual employers, and that by placing each and every member on the same footing it has removed all feeling that one might have some advantage over another. That being true, it has placed us on a plane where we can dispassionately review and judge the entire situation, saying that, if such be the facts, wages are too low, we can afford to pay more, either taking it out of the profits of capital or adding it to the price of the product.

We are in a position to know what are the world wide conditions governing our business, and are far better able to judge what can or cannot be done for the workers than they are themselves or are their chosen representatives. The successful employer is by nature endowed with the qualifications of a leader. His opportunities for education, experience and all that goes to make a sound, conservative, broad minded judge of industrial conditions are beyond comparison superior to those of the worker.

Remove the necessity for fearing that this competitor, by working shorter hours or any other condition giving him undue advantage, can force him out of business, and you have placed the employer in a position where he can do more for the cause of humanity than any labor organization ever thought of, and moreover you have placed him in a position where it is to his interest so to do, and this is what you accomplish by organization.

This is the future for the American Federation of Employers. Do you think this is a conceited view? Do you see any way by which Cincinnati would be individually benefited? Do you see any way by which any section would be benefited at the cost of any other section? I tell you if any of you have that feeling, get rid of it. It is unworthy of the work before you, a work which I firmly believe will glorify the twentieth century. Nor do I expect or believe that a quarter of that century will have sped before the world will recognize this to be the true solution of the industrial situation.

It is perfectly true that at present these views would probably be considered those of an enthusiast, but if you will carefully consider them dispassionately separated from all local conditions you will find them based on sound logic. Having carried you to this point, having tried to show you that our ideal is high and worthy of the best efforts of our association, I want to indicate the practicability of its attainment.

If in doing this I refer to our work here, I trust that you will appreciate that it is only for the purpose of illustration and in no sense for comparison. We are far more conscious of our shortcomings than any outsider can be, and are in no way inclined to throw bouquets at ourselves, but in the firm conviction that our purpose is high and that its realization would advance the cause of humanity we may be pardoned for desiring to persuade others to our way of thinking.

The Employment Bureau.

The employment bureau is an instrument of the local association. Without such an association there could be no such bureau. The local association is an absolute necessity, as I believe the experience of the National Metal Trades Association has already proved. If argument is necessary I could not do more than to direct your attention to organized labor, probably the most perfect organization known. We are in opposition to the abuse of the power invested in this organization, and we are poorly equipped at the outset if our organization is inferior to theirs. We must form strong locals in each trade, unite them into national organizations and affiliate those nationals into the American Federation of Employers if we are to place the employer in the position he is entitled to and should hold.

We have a nucleus of local association already formed. The past year has added largely to the list and they have accomplished results that not only should induce every member to remain loyal to his local, and forever retain his membership, but should be a shining example for other localities to follow. Experience has shown that when the exciting cause has been removed there is danger of the interest falling and of members dropping out. The reason for this is simply that employers have not time to spend or money to give to what is accomplishing no result that they can see. Let every local establish a labor bureau and its members will see more than sufficient results to prevent their losing interest.

The employment bureau will give any member the names of workmen to fill vacancies. The employer will know that such men are of good character and not likely to give him trouble. This in itself is worth the money he pays for the support of the local. Add to that the fact that if he is not a member of the local his men are very apt to get letters from the labor bureau offering them other positions, not intentionally, you understand, but simply because so far as the bureau's records can go a man is unemployed when he leaves the shop of a member of the local. So true is this that cases have been known here where the bureau has taken men out of one member's shop and put them in another, simply because the member failed to report the hiring of the man and his name was therefore on the unemployed list.

It soon becomes known to the men that the bureau is friendly to them; that they can get just grievances redressed through its services with no danger of securing the ill will of anybody; that they can find positions without the necessity of spending car fare or taking time; that they can even notify the bureau that they want to change and secure its assistance. Of course, in this latter case the employer is first notified and has first opportunity to satisfy the man, but if unsuccessful the bureau helps him get another job. All of this makes the bureau popular, and men prefer to work in shops in which it is interested. This results in the members of the local gradually getting the best men in the locality. These reasons form a total making it an attractive proposition for an employer to belong to the local association and assures his permanent interest.

The disciplinary feature inherent in this form of organization is seldom alluded to or employed, but that it is there is recognized by every one. The bureau has induced men on strike, men away and apprentices to return to work, and it is only necessary for the secretary to request any man on his list to call to insure that man's doing so. The bureau can know every agitator or disturber, it can know who are good men and who are bad. No record is ever made injurious to a man's character without first having him call at the office, hearing his side of the story and consulting with his employer. This method is in no sense a black list, but is in very truth a white list. In cases where a man is proved an undesirable workman the bureau simply declines to recommend him; the employer is at perfect liberty to employ him even then if he so desires.

I could detail many instances of the wonderful influence of this department, but I do not want to weary you, and Mr. Fisher will give any detail you desire. What I principally want to impress upon you is that this influence appeals to a workman as friendly or otherwise just to the extent his conscience clears him of evil intentions or the reverse. What does this teach us? What conclusion are we justified in drawing?

Employment Bureau a Benefit to Cincinnati.

Two years ago Cincinnati was in the throes of the great machinists' strike. Its condition was no whit different from that of any other city. To the best of our knowledge there were only 600 men in the Machinists' Union, yet they drew some 3000 men out of our shops, and for eight weeks closed them tight. Every association shop had posted a notice of a 54-hour weekly schedule before the strike, but every one withdrew it after the strike, and at the end of the strike every man that was taken back at all came back at not to exceed the rate paid when he went out. Almost immediately after that we started our employment bureau. To-day we have 6000 names in our files, and the best information obtainable shows less than 150 members in good standing in the Machinists' Union.

In the face of this condition, knowing as positively as any one can know such things that no strike would be called here this year, and that if it was we were unquestionably in a position to win it, our local decided to reduce the working hours from 57 per week to 55, with no reduction in pay, having had at the time no demand from our men for this concession. Our action was taken solely from the belief that we owed it in justice to the men. I have mentioned this merely to indicate our position and that we are consistent in the policy we are urging you to follow.

To those of you who have local associations in your district, I urge the installation at once of the employment bureau. List every man. Take the necessary means to find out whether he is an organizer, a disturber, a time killer. Take such steps as are justifiable in persuading that man of the error of his ways. A good local secretary can do much in this way. Find the good men, prove to them that your bureau is for their benefit, place them in your important positions. Have foremen's meetings at your locals, where they may meet all the employers, and find them not only good fellows, but broad minded business men. Have such papers that will interest them in their own special line interspersed with others that will show them what conditions the employers have to meet in active competition. In every way undermine union influence by showing them that they can get what they most want without the necessity of paying anybody for it.

New Publication.

A Few Points on Grinding. By Charles H. Norton. Published by the Norton Emery Wheel Company, Worcester, Mass.

Much valuable information in a very condensed and yet clear form is contained in the pamphlet reprinting an article which appeared recently in the *American Machinist*. The writer states that one common error is a notion that to produce a fine finish, the grain of the wheel must be as fine as the surface desired, while the truth is that a really fine surface can be obtained with a coarse wheel if certain facts about grade, speed, depth of cut, speed of work surface, &c., are observed. These things are of such great importance that when understood, the right wheel selected and used in the right way, work that has required from 10 to 12 hours may be done in one hour. Considerable difference of diameter of work will also affect the cutting quality of the wheel on any given material. The wheel that has proved successful on a smaller diameter may work much slower on a larger wheel, while the wheel that has been most suitable on a larger diameter may wear away much faster on a smaller one. There is seldom a case where one and the same wheel can be used on the same work without greater loss of time than a change of wheel would involve, and when work is duplicated the loss by using an unsuitable wheel becomes very great. Different conditions of the machine on which wheels are used affect the wheel. A heavy machine with massive spindle calls for a different wheel and different treatment than with one lighter and with smaller spindle. This is true of all kinds of grinding machines and explains much of the mystery surrounding the wheel problem. The relation of the speed of the work to its feed or side advance has much to do with the results; also the surface speed of the work and speed of the wheel. The old notion that any round wheel made of emery was a grinding wheel, and that because it is grinding work any one can do it, must give place to the understanding that the question is one of so great financial importance that neither the ignorant sweeper nor the journeyman toolmaker will do to trust with it. It requires men with natural intelligence and ambition, who have unformed ideas, and therefore are ready to absorb right ones, and who have no old time notions to advance or experience to lead astray. The writer believes that many of our machinery works can realize large returns by employing a man

whose entire work shall be the study and practice of grinding and who shall have absolute control of the selection, purchase and use of grinding wheels; also dictate the work to be ground. A close study of the pamphlet will well repay any one in any way interested in the use of grinding machines.

The Ideal Foreman.*

BY WILLIAM LODGE, CINCINNATI.

This title, "The Ideal Foreman," is not chosen by myself. The title is enough to make any one smile, because I doubt if any of us ever saw him, and, I think further, if all the men in this room were to know that this ideal foreman could be had there would be a much bigger scramble to get him than if a shower of gold had been thrown among us. Seriously speaking, it is difficult to find the ideal. Nevertheless, there are qualities existing among the foremen that we all have in our employment that go to make a part of the ideal character for which we are striving. The conditions in this country make it clear to the mind of any thinking man that the ideal foreman would not remain in the employment of any body, but would be operating for himself. Therefore, as he is absent and unobtainable, let us discuss the possibilities of using such men as are obtainable to the best advantage.

Do Not Require Too Much Service of Foremen.

There are many mistakes made by owners of shops requiring so much service from a foreman that if properly done it would take at least two to ten men to perform, and when this mistake is made the output of that shop not only suffers in quality but also in quantity. To illustrate: Suppose a foreman is employed and expected to handle 100 men, the nature of the product being diversified. Every one of these 100 men must not only be instructed separately and individually as to what the work they are doing must be, and be tested to be sure that they know how to read a drawing; but each one must be seen individually and continuously every hour in the day, so that it will be known by the man in charge as to whether each particular man is giving back a sufficient amount of service for the money he is paid. The employer, under these circumstances, having in mind economy, thinks that a foreman should be able to handle the whole situation and requires him to do so. The foreman accepts the position under these conditions and simply does the best he can. But in many cases he is spread over entirely too thin, and it is utterly impossible for him to keep thorough track of not only the work but the method of doing it, the quality as it leaves his hands, and the quantity furnished. A foreman, in addition to this, must be fully posted on all orders, and if they are much diversified this of itself is sufficient employment for a good man. Yet he is being called upon either to give out work, or to see each and every man as to the method of doing it, and whether he is doing a sufficient amount of it. All that would be necessary to convince you of this would be to look over your own daily routine of work, which appears at times to be overwhelming, and yet it forms but a small part of the whole work required about a reasonably large establishment. Any one of us who has a man to whom we can leave the entire management, and who can not only show results that are entirely satisfactory, but can keep his temper and keep his men all in good humor, is to be congratulated.

Divide Work Up Into Small Portions.

In my own rather long experience in managing machine shops I have found it very necessary to divide the work up into quite small portions; instead of one executive man, have ten, and it frequently happens that excellent service is obtained at no cost. This is rather a startling statement and I will illustrate its meaning. Suppose 100 lathes to be under the foremanship of one man and the work somewhat diversified. It is no uncommon thing under such conditions for workmen to wait on the foremen either for work or for instructions about the work to the extent of one, two or three hours. I have seen it.

Now suppose that 10 lathes were selected, and one of the men running the 10 lathes was approached about as follows: "John, suppose I were to give you charge of these 10 lathes, and all you had to do was to see that each and every lathe was using the best tools, ground exactly right, and the proper speeds and feeds, how much more work per day could you produce?" I would be almost ready to guarantee that more than the product of one additional lathe could be had from the 10 under such a system. In that case the increased output more than pays the man's wages. Consequently he does not cost anything to the company, and besides this he relieves the general foreman to quite an extent.

If this was carried out with the whole 100 lathes, the output would probably be increased from 25 to 40 per cent. in the first place. It would be very difficult for any one foreman handling 100 lathes to bring about this. By personal supervision of each man and machine this would be equivalent to from 25 to 40 per cent. equipment. If $50 of profit was being made on a machine, and 40 per cent. more machines were made, it would mean 25 to 40 per cent. more profit; so that on this point it appears to your humble servant that the method described is well worth considering.

Value of a Good Temper in Foremen.

A very large per cent. of loss is often due to the unfortunate temper of a foreman. If he gets angry because a man asks him questions, the man will approach him as seldom as possible. If he is impatient because the workman's understanding is a little dull, and he does not comprehend his instructions quickly enough to suit the foreman, and the foreman leaves him in this condition, the man must grope his way along in discouragement, or endeavor to get the information he needs from some good natured workman in his immediate vicinity, and the product again suffers. The man with a nice, obliging disposition is far better adapted to become the ideal foreman than the one with a cranky disposition.

Again, in my own experience I have found that while a foreman was quite efficient in getting the work up to the men and making them understand pretty well just what was to be done, he was utterly lame in so far that he would pass by both men and machines without paying attention as to whether the man was turning out two hours' work per day or ten hours' work. Now this man was a perfectly efficient man in every other particular, and the proper and the only thing to do was to fill the gap in his make up by supplying what was lacking, which consisted in this case of the very methods described—namely, by employing a man to look after the grinding of the tools, the feeds, the speeds and the output. Again, should this man turn out to be unable to handle men by reason of his not having the proper disposition, serious damage may be done, or perhaps I had better say the results obtainable would not be obtained.

To illustrate once more: If such a man finds that one of the workmen is doing only five pieces, and believes that he can do ten, and tells him so, and the workman very readily tells him that he will not try, and his discharge follows, then a new man must be broken in, which always, or nearly always, entails a loss. If, however, instead of the foreman permitting him to leave his employment for the reason given, he had said, "Now, John, nobody has any use for the man who will not try; any man would surely be willing to try, and suppose now we test the case out, and see on one piece how nearly we can approach doubling the product;" and then wherever any little item was lacking in the particular form of tools, the grinding, the speeds or the feeds, and these were pointed out in a rather jolly, good natured way, and it was actually proved to the man that the product could be doubled, and then a little encouragement was given by saying that when it was doubled he could have an increase in his pay, great results would be forthcoming.

The results obtainable in a shop are always much greater if one set of men can be kept employed and become accustomed to the work and the foreman, and the

* Address at the special convention of representatives of local employers' associations, held in Cincinnati under the auspices of the National Metal Trades Association.

means and general conditions under which the shop is run, as each man becomes familiar not only with the shop routine but knows exactly where to go for anything that is wanted, and having passed through an experience on one piece of work he would naturally do the next piece quicker, and the next still quicker. It is therefore seen that an impatient or bad tempered foreman, who is continually changing workmen, is hurting the output, and consequently the pocketbook of the employer to an extent that would be alarming to the employer if he knew it. How frequently have we found in our experience two shops engaged in the same line of business in the same town, having about the same amount of capital employed, selling their goods in the same market, where one would be making three to four times the profit made by the other, and yet the workmen are passing from one shop to the other frequently. It is very clear that this state of affairs is not brought about by the men (I am alluding now to the difference in the earnings of the two companies) but by the management or the foreman.

Many foremen are inclined to take life easy. They accomplish some little thing that effects quite a saving, and immediately become inflated to such a degree that they believe the proper thing to do is to sit down and rest on their laurels, losing sight of the fact that they are employed and their salaries are paid for doing just that very thing—not once in six months, but once every day if possible, and if the opportunities are there, once every hour. Great results are never obtained except by hard work, and particularly by continuous work. Having obtained good results on one item, it must be borne in mind that this one item cannot affect the whole product or the entire building of a machine. A single item in building any machine, unless carried through to the end, would make hardly any diminution in the amount of hours used on the building of the whole machine.

Foremen's Suggestions Should Be Encouraged.

How many times I have seen, just by reason of some little improvement made in one direction, an unbalancing of the plant, getting more work from one department than all the rest of the plant could keep up with. In such cases a rebalancing is necessary. This results at times in a request on the part of the foreman for a new planer, a new shaper, a new miller, a new gear cutter or drill press, and the company may have devided that they will not buy any more equipment for that year, and when this happens the efforts of a good foreman or superintendent are largely thrown away, because if all the rest of the plant is not put on a suitable basis to keep pace with the fastest part of it the good work has then largely been lost. This continual balancing of a plant is of more importance than many machine shop owners believe, and I should advise that great care and attention be given to it.

It is exceedingly discouraging to the foreman or superintendent who, having gotten to the point where he feels somewhat inflated, is sat down upon by the owners, making his efforts utterly void. Any one will readily see how quickly such a man would become discouraged, and the same thing holds good from the superintendent down to the poorest workman in the shop. Should a lathe hand or a vise hand point out to the foreman a new or a better method of doing the work, or a method that would save money, and his suggestions are received very coldly and no attention paid to them, that hurts his usefulness in this direction. A good foreman will at all times particularly encourage the men who make suggestions, speaking to them in a very pleasant manner, and assuring them that he will call the attention of the higher authorities to his suggestion, which will not only encourage him to make others and better ones, but discloses to the employer the fact that he has a man in his employment who thinks, and when he needs some one to fill a better position he knows where to put his hands on him.

It is highly important that all employers, if possible, follow such matters, and if the nature of their business will not permit this, then if they can encourage the superintendent in such a way as to make him feel perfectly easy that no harm will come to him by reason of his having pointed out the improvement made by any one of the workmen good results will be bound to follow. Suppose even a casting cleaner, whose business is to rub and chip castings, discovers a means by which he could do two or three times the amount? He should not only be encouraged, but if the circumstances will permit some monetary reward should be given him, and certainly the foreman should tell him that his suggestion is good and that if he makes many more it will be necessary to advance his pay, and possibly advance him in his work. Of course there are always places where such men can be made more useful than in the cleaning of castings.

A Foreman Should Use His Eyes.

The ideal foreman will cultivate the habit of seeing with his eyes continually. There is nothing that makes a foreman more lame than the absence of this trait in his make up. Every step he takes in every minute of the day, if this habit is cultivated, will show him some point that can be bettered or improved, and he should not only make use of it himself, but if possible educate every man under his charge to cultivate the same habit. It is deplorable to have a foreman who is an excellent mechanic and all right in every other particular but utterly without this trait, and I have no doubt every one of us has seen such men. I remember having at one time a man who was so excellent a mechanic that I thought there was no possible chance in making a mistake in giving him charge of the shop. Within a month, however, I found that he was incapable of handling it, and almost for no other reason than that he was unable to see; he had not cultivated the habit of seeing. He would walk through the shop from end to end, swinging his rule, and the work in all directions was crying out to be taken hold of, and the man unable to see it. In a little while such a man would have utterly destroyed the profit making capacity of a shop, and he would have done it innocently. Now I knew there were good things to be had from this man and studied very hard how to get them; so one day I said to him, "Here, Jim, take this piece of work and sketch out for me the very best means of doing the best work in the least possible time and in the best possible manner," and, sure enough, I found I had struck his gait and at this employment he was worth a fortune. But this very man twice attempted to run a business for himself and twice lost every dollar he had, and all because he had not cultivated the habit of seeing.

A foreman who cultivates the habit of seeing discovers where the plant is lacking or where his department is lame, and that is the point where certain parts that are necessary to complete the work he has in hand are not forthcoming. The good foreman will endeavor to get these. If he finds that the capacity of the shop will not give them to him, he will sit down at the place where they are being made, put on his thinking cap and try with all his might to see whether he cannot make that particular piece in one-half the time, and very often this will result in its being produced in even less time than that. This is the kind of foreman that is especially and particularly valuable, providing that while he is engaged at the work above mentioned he does not forget all else under his charge to such an extent as to let it suffer. You can readily see how this could happen and how necessary these various qualities are to make up the ideal foreman.

Some Small Matters Make Great Savings.

There are thousands of occasions, at the planer for instance, where a very little expenditure in money for the making of small appliances will accelerate the work anywhere from 50 to 100 per cent., and every day that such cases are neglected or passed by the foreman is failing to do his duty as it should be done. The proper shaping of tools, the proper grinding and the proper mounting cut as much of a figure here as at the lathe, and if complaint is made to the foreman of this department from the foreman of the vise department that the work is coming from the planers without being sufficiently true immediate action should be taken, because it frequently happens that five minutes' work on the planer means five hours at the vise.

We are all being taught that a range of speeds on the planer is just as important as the range of speeds on a

lathe, and the foremen who neglect this are not serving the interests of the employer as they should. In vise work cultivating the habit of seeing is of as great importance as in any other part of a shop. I have frequently seen the cost of work cut in two because this habit had been cultivated. Should a foreman see a workman using a file, it is his business to investigate as to whether the work being filed could not be machined, and very frequently it will be found that this is not only the case, but that better work can be had at much less cost. Roundabout methods of handling work may often be dispensed with, and the wideawake viseman may frequently suggest that pieces that are being machined and bolted on may be cast on and serve the purpose just as readily without in any way hurting the quality of the article being made. The foreman should continually encourage these suggestions, making it attractive to the men either in the way of better work, more wages or a reward of $5 or $10 occasionally. In this department, as in any other, careful note should be taken of the time in which a piece of work is done and compared either with the last time or the next time in which this same piece is done, and particularly so if done by different men. This gives the foreman an opportunity of finding the respective values of the men under his charge.

In the drilling department as much time may be lost or gained as in any other part of the shop, and my friend Mr. Norris will no doubt argue that even more may be done in this department by its proper handling than in other parts of the shop. How often the mere idea of a little templet, costing perhaps but a half hour's work, will save its cost three or four times over in the drilling of two dozen pieces, as compared to laying off each piece, drilling to a circle, drawing over the center, and all the consequent loss involved in this method of drilling. I believe the milling and the gear cutting are just as susceptible of saving as any other department in the shop. While we frequently use apprentice boys in this department because of the simplicity of the work, we must not forget that the tools used here are all of them of a very expensive character, and that feeds and speeds and methods of holding and chucking are of as great importance here as anywhere.

The foreman must not forget that the part of the shop employing common laborers is just as much an item of cost as any other part, and foremen frequently make the mistake that because a laborer receives only 15 or 17 cents per hour his time is not valuable. For instance, a lathe hand may be employed one hour at turning a piece of work, and as this goes into the productive labor account, the polishing is turned over to a man at, say, 15 cents per hour, who may spend one and one-half hours at polishing this piece, making the cost even greater than the productive labor has cost. This same idea will hold good where laborers are put to help machinists without their time being taken account of. It must not be forgotten that though the cost of the laborer is but one-half, it is still 50 per cent. added to the cost of the work, and frequently a little device studied out by the foreman will avoid the necessity of the helper being present. In the pattern shop how often we see a 30 or 35 cent per hour man employed in rather lazily sandpapering his pattern. This is a waste of time, as less expensive labor could very readily perform the work, and the time of the expensive man be saved. In this department again our friends who make wood working machinery could be of great service to us, and I would advise them to give a little more attention to the manipulation of patterns made in wood by the use of machinery, which will save a large part of the time and do the work quite as well.

The Slater Engine Company of Warren, Mass., have made an assignment to G. W. Anderson, a Boston attorney, for the benefit of the creditors, pending a reorganization of the company. A meeting of creditors will be held in a few days, at which time a statement of assets and liabilities will be made, and the plan for reorganization will be submitted to interested parties. In the meantime the several departments will be operated with a small force of men to complete existing contracts. The company employ about 100 men.

Testing Car Equipment at Purdue University.

INDIANAPOLIS, IND., May 18, 1903.—Purdue University, Lafayette, Ind., is the official testing institution for the Master Carbuilders' Association. A machine, designed by the association, to determine the coefficient of friction of brake shoes on a standard car wheel is in operation there. The great weight of the modern car, the high speed of trains and the importance of stopping them quickly have made the brake shoe question an important one in the expense account of railroad companies. The size of the standard shoe now in use is 3⅜ x 13¾ inches, and it weighs 25 pounds when new. The mileage obtained from a shoe varies with the character of the shoe, the schedule of the train, the profile of the road and the character of the roadbed. Attempts to reduce the wear by making the shoe of harder iron have demonstrated that the harder the iron the less the friction. The efficiency of the shoe is reduced as its life is increased.

The testing machine at Purdue University is operated by a 100 horse-power engine. A system of levers forces the brake shoe against the wheel, a delicate mechanism registers by an irregular line on a scroll of paper the retarding forces, a dial shows the speed and a chronograph the time. Many new inventions in shoes of complex construction have been tested and there has been much research work. The latter has for its purpose a determination of the effect of definite areas of chilled metal in otherwise soft shoes. From the data obtained in these tests the university expects to solve the brake shoe problem.

Another machine just completed for the association at the Altoona shops of the Pennsylvania Railroad will be sent to Purdue University. It is a drop testing machine for testing car couplers, draft gears, axles and wheels. The hammer has a weight of 1650 pounds, the steel guides for the drop are 54 feet high and the anvil weights 17,000 pounds.

The Eastern Tube Company in Receivers' Hands.

A receivership has been granted on the application of the Central Iron & Steel Company of Harrisburg, Pa., against the Eastern Tube Company of Zanesville, Ohio, by Judge Thompson, in the United States District Court at Cincinnati. The latter concern owe the Central Company the sum of $6339.80 for materials purchased, which is past due. The action of the Central Iron & Steel Company was taken to prevent the affairs of the company being tied up in the hands of several courts, which many of the creditors of the Eastern Tube Company had announced their intention to do. They claim that there are now in the offices of the Eastern Tube Company orders which, if filled, would aggregate $500,000. They hoped that by the appointing of receivers the affairs of the company could be carried on under the direction of the court and in time satisfactorily adjusted and the legal representatives relieved of their duties. The petitioners recite that the company were capitalized at $1,000,000 under the laws of West Virginia, and of this amount $565,000 of the stock was sold and the remainder hypothecated with various firms, persons and corporations to secure the indebtedness of the defendants. They owe over $800,000, about $60,000 of which is overdue and unpaid. It is estimated that a like amount will be due within the next two weeks. The plant, which adjoins the city of Zanesville, covers 45 acres, and is valued at $400,000. The other assets consist of $40,000 in banks and bills to the amount of $122,000. The receivers appointed were W. C. Matlack of Elizabeth, N. J., and W. E. Guthrie of Zanesville, Ohio. The plant of the Eastern Tube Company was completed about a year ago for the manufacture of wrought iron and steel pipe in sizes from ⅛ to 16 inches in diameter, and having an annual capacity of about 75,000 tons. C. E. Corbett was manager, with headquarters in Pittsburgh. The plant is now idle, but will probably be started up by the receivers within a short time. A statement is being prepared which will be issued to the creditors before long.

The Iron Age

New York, Thursday, May 28, 1903.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - - - BUSINESS MANAGER.

The Wall Street Iron Market.

Business men who have their eyes fixed too steadily on Wall Street during these days are likely to be misled seriously. Wall Street is now running an iron market of its own. It is determined to smash values on iron and steel, and seizes every opportunity to represent the iron trade as rapidly getting into bad condition. With so many industrial stocks now being traded in on the Stock Exchange, it is expected that much greater attention will be given to happenings in the manufacturing world than before the days of consolidations. But the trouble is that little incidents that may be construed unfavorably are used for the purpose of depressing stocks, and are thus liable to be magnified into events of the first importance. If no actual occurrence is available something is invented for the purpose of influencing the stock market. There is always most danger that something of this kind will be done when the general tendency of stock speculation is downward and the bears are actively seeking for depressing influences with which to hammer the market still more. For instance, Wall Street was convinced a few days since that the price of steel billets had been cut, even though at the time of the rumor the demand for billets was beyond the capacity of the domestic producers. That the rumor was started by some one not familiar with the iron trade was the fact that the credit for the cut was given to a company distinguished above all others for conservatism and for the avoidance of action likely to unsettle the real iron market. The absurdity of the report thus prevented it from having any effect on the trade, but it was accepted very seriously in the Wall Street iron market. Hardly had this been disproved when reports were spread broadcast that important mills owned by the United States Steel Corporation were to be shut down, presumably for lack of orders. These reports were denied as soon as they reached the officials of the corporation, but they had already served their purpose in depressing industrial stocks.

It must be admitted, too, however, that men prominently connected with the iron trade will allow themselves to be quoted in unduly roseate interviews which are obviously intended to produce an effect on Wall Street.

Influences tending toward lower prices which have recently occurred are well understood in the iron trade, although imperfectly comprehended in Wall Street. The price of pig iron is falling, but it had been advanced to an abnormal hight by the scarcity of cars, shortage of motive power and general inadequacy of transportation facilities to handle the extraordinary traffic of the past year, which prevented furnacemen from securing a regular supply of coke from the coke regions and also from delivering iron regularly to their customers. The anthracite miners' strike also contributed to the restriction of the fuel supply for blast furnaces. If every furnaceman had been able to get enough fuel to run his furnaces to their capacity last summer and winter it is not likely that much pig iron would have been imported and prices would certainly not have been nearly so high. The reductions now being made are merely bringing prices down to their natural level. They do not indicate a collapse, but, on the contrary, will avert the collapse which would have occurred if high prices had been maintained long enough to check consumption seriously. The reductions may in fact be regarded as simply the wiping out of premiums for prompt delivery. The same explanation applies to a great extent to a few other products on which premiums were paid for a time for prompt delivery, these also having been wiped out by the freer movement of material by railroads and the consequent general loosening up of an embarrassing and exasperating situation. It was a situation which was satisfactory to nobody, as manufacturing operations were impeded on all sides because of scarcity of supplies. The high prices quoted represented quite limited transactions.

So far as the earnings of iron and steel companies are concerned, they will be improved by the better conditions now prevailing with regard to the regular receipt of raw materials and the delivery of manufactured products within a stipulated time. The greater part of the volume of business in process of completion represents contracts taken much below the premium prices of last fall and winter, but at prices considered fairly remunerative by the sellers. In fact, they would doubtless be well satisfied if they were able to maintain such a level of prices permanently. The largest producers and manufacturers were at no time in sympathy with high prices, but used every influence at their command to keep them down, causing a noteworthy disparity between the cost of raw materials and the selling prices of finished products. If, now, raw materials or partly manufactured products more nearly conform to the values of finished products, does that appear to be a matter calling for hysterics? It may justify hysterics on Wall Street but not in the counting houses of iron men.

The heavy purchases of pig iron the past week by the United States Steel Corporation, for delivery during the third quarter of this year, should have a reassuring effect on business men who have been disturbed by the antics of the stock market. It may be assumed that the management of the corporation would not at this time make purchases of such magnitude if it was not clearly seen that the pig iron would be needed in filling orders already booked for finished products. Untoward circumstances may in time check the enormous consumption of iron and steel, but at present the conditions are far from alarming. The labor troubles now existing are of a purely local character, and likely to be settled at any time, so that they are not to be feared as seriously curtailing the demand for iron and steel. As to the iron and steel trades themselves, they are happily free from labor disturbances. Meanwhile the bears will have their day on Wall Street.

The Volume and Circulation of Money.

Recently several persons who were active a few years ago in urging the free coinage of silver have been seeking to justify themselves by alleging the increased gold production as an explanation of the present prosperity. "We told you," they say, "that the country needed more money in order to be prosperous. It has got more money and it is prosperous. The quantitative theory of money is justified. The only error we made was in being unable to estimate the increased gold production. The country has been able to get along without silver because it has had so much more gold."

The free coinage of silver would not have resulted in an increased supply of money because it would have driven gold out of monetary use, just as depreciated pa-

per did during the Civil War. Even if the country had needed an increased supply of money, the unit of value being maintained, it does not follow in the least that an increased supply would have been beneficial if the value of the unit had been reduced and all prices thrown into confusion.

But the really important inquiry raised by this apology of the silver dollar advocates is the relation between prosperity and the increased supply of gold. The increase in the stock of gold used for monetary purposes in this country from 1896 to 1902 was $328,795,735, or less than 60 per cent. The bank clearings of the country, which are a fairly good index to the volume of trade, increased $67,000,000,000, or more than 131 per cent. If so small an increase of gold was in any sense the cause of so vast an increase in business it was only by means of some other factor, and what that factor is no silver advocate has ever suggested.

In 1894 the bank clearings only slightly exceeded $45,000,000,000. In the calendar year 1902 they exceeded $118,000,000,000. The increase is more than 160 per cent. The increase in amount is $73,000,000,000, and the increase in gold coin and gold certificates in circulation was less than $375,000,000. It is impossible to trace any connection between the increase in gold and the increase in trade.

No silver advocate has ever given any attention to the fact that the bank clearings are vastly greater than the amount of money in existence, or any amount that he estimates that free silver coinage would increase the amount of money to. How is it possible for so small an amount of money to settle so much trading? By the fact persistently ignored by advocates of the quantitative theory that at least nine-tenths of trade is effected by instruments of credit, rather than money, including in the latter paper money, which is itself an instrument of credit. Credit, then, is at least nine times as important as cash, yet the victims of the quantitative theory concentrate their attention on the cash and ignore the credit.

The bank clearings in 1894 were only 27.1 times the volume of money in circulation, not gold only, but everything that is commonly called money. The ratio of clearings to money in circulation increased moderately and irregularly from 1895 to 1898. Then there came a great increase in business and the clearings jumped to 46.6 times the amount of money in circulation, and in 1902 the clearings were 52.5 times as great as the money in circulation.

The change in the activity of money, or the rapidity of circulation, then, is vastly greater than the increase in the volume of money, using that word in its broadest significance. It is not the amount of money that makes business, but the amount of business that makes bank clearings, only the balances of which are settled by transfers of currency.

Between 1896 and 1902 the amount of money, including coin certificates, in circulation increased about $743,000,000, or nearly 50 per cent. But the greater part of the buying is done by checks against bank deposits. The individual deposits in national banks, and the deposits, not classified, in State and private banks and loan and trust companies increased in those six years a good deal more than $3,500,000,000, or 120 per cent. The loans of national banks—that is, the credits which those banks extend to their customers with which to buy materials and employ labor—increased 73 per cent. in the six years, or in volume nearly twice as much as the money in circulation increased.

The present prosperity is due to the re-establishment of credit, to the replacement of capital lost by bad investments and unprofitable crops during and prior to the period of depression, and to the accumulation of profits during the last few years. This prosperity, or increase of business, accounts for some increase in the supply of money and an enormous increase in the use made of money and credit. The recent crops have been very large, and the railroads have provided themselves with increased rolling stock. The rolling stock has not increased the crops, but the crops have been the occasion for increasing the rolling stock, and as business has increased it has provided itself with increased instruments of exchange, a small part of which is currency, and far the greater part is checks and other instruments or evidences of credit.

The Osaka Exposition.

The newness of so much of her civilization as bears resemblance to that of the Occident makes Japan seem like a veritable infant among nations. Her native civilization, of a very amiable and attractive kind, is old enough to make modern Europe seem like a creation of yesterday; but only within 15 or 20 years has Japan made noticeable progress toward the assimilation of her peculiar institutions to those of the West. During that time, however, her progress has been astonishing. The question whether what she is outgrowing is more or less desirable than what she is acquiring is purely academic. As well ask the same concerning the amusements and occupations of childhood of one who has assumed the responsibilities of man's estate. The simple and beautiful civilization which is so old as to seem almost indigenous to Japan is in no respect adapted to twentieth century conditions, and to take her place and fulfill her high destiny among nations, she has had to adapt herself to the conditions of Western civilization. China's failure to do this has brought her into her present deplorable condition of dependence for the maintenance of her territorial integrity upon the patronage of the powers. She is not quite in the position of Turkey, but the influences tending to her dismemberment are only restrained by international jealousies, and the reasonable certainty that if the fences were once broken down Russia would want, and ultimately take, all she could reach, and that her appropriation of the entire Pacific coast of the Chinese Empire could be prevented only by force constantly and permanently exerted. Russian diplomacy is extremely patient. The plans of Peter the Great are still pushed as industriously as, and much more effectively than, in the days of their inventor.

Japan differs from China in every essential particular. She has been quick to appropriate all that was readily assimilable of Western civilization. Her army is equipped with the most effective arms obtainable, and for drill and discipline will compare with the best troops of Europe. She has favored the railroad, the telegraph, the telephone and all the facilities for intercommunication which tend to make her a homogeneous nation. Her industries are planned on modern lines and her productive machinery is a successful adaptation of the best the world can show. Her Government is broadly constitutional, and from it every trace of Oriental despotism has been eliminated. Her educational system is attaining a wonderful completeness and is better than that of many parts of our own country. Her natural resources are being explored and exploited on scientific lines and are sufficiently extensive and varied to promise vast accessions to the national wealth. The latest evidence of her enterprise is found in the lately opened National Industrial Exposition at Osaka, of which very few foreigners have ever heard, but which in its way is a remarkable undertaking. No effort was made to give this exposition an

international character. It was for the education of her own people, to make them aware what had been accomplished in Japanese industry, and to show them what still remained to be done to develop and diversify the applied arts and sciences in their relation to Japanese materials. From this point of view it is a great success.

It is interesting and significant that the first place is given to education. The average attendance at primary schools of Japan is 88.05 per cent. of the total number of children of the age for primary instruction. We venture to say that in no other country of the world has popular education made an equally good showing. In 1901 the number of schools of the academic grade and the average attendance was reported in the national statistics as follows:

	Schools.	Pupils.
Middle schools of all descriptions	216	88,390
Girls' schools	70	27,510
Special schools	57	17,887
Agricultural, commercial and technical schools	398	36,446
Supplementary schools	1,474	95,751
Totals	2,215	243,984

The exhibits in the Educational Building consist largely of the work of pupils and are said to compare favorably with the best work of Western schools of equivalent grade. The exhibits of the technical and art schools are remarkable.

In the Machinery Building the exhibits are wholly of Japanese manufacture. While none of them would be considered epoch making in an American or Western European exposition of the present period, they are remarkable indeed considering the recent establishment of machinery building as a local industry. Statistics compiled by the Department of Agriculture and Commerce show that in 1901 2278 manufacturing establishments in Japan were operated by machinery, with 3593 machines, consuming 82,092 horse-power. There are over 5000 native machinery exhibits in the exposition, looms predominating. There are some extremely good three-phase electro motors, and quite a variety of clever electrical machinery and apparatus. The Kimoto Iron Works exhibit a throwing and weaving machine, which is said to be as good as anything made in the West. It has been purchased by the Kyoto Imperial University for the use of students in the textile department. The exhibits of the Shibaura Iron Works include a water tube boiler, the invention of a native marine engineer; an electro motor of 12 kw., direct current, also of native design, and a number of other creditable Japanese products. The Kobukruro Iron Works exhibit cranes of large size and heavy machines, which are attracting a great deal of favorable notice from foreign visitors. There is an extensive array of machines for silk handling, tea curing and other native industries; also a good display of steam pumps, intended chiefly for irrigation. The proportioning and workmanship on these natives machines show that they are adapting foreign methods intelligently to native materials and native needs. There is very little of the slavish imitation which characterizes Chinese work, the difference being that the Japs have originality and good mechanical sense, and never do anything for which they have not the best of reasons.

The Industrial Building, which embraces all the arts not separately classified, contains 170,938 exhibits, which include the exhibits in four groups of mining and metallurgy, chemical industry, dyeing and weaving, and miscellaneous manufactures. Perhaps the most important of the last group is the division of ceramics. Lacquer work, however, is not far behind in interest and importance. Japan in 1901 had 2477 manufacturing corporations, with a capital of 166,000,000 yen. There are more than 7200 workshops employing more than ten mechanics each, and the consumption of coal for steam power is said to be something over 2,200,000 tons. These data are admittedly incomplete and are useful only as indicating recent Japanese progress in industrial development along modern lines.

The Osaka exposition is unique among industrial fairs in that it is wholly divested of advertising features. Foreign visitors are welcome, but they find everything labeled in Japanese and no intelligible directions for those who do not read that language. Its purpose is distinctly and exclusively educational, and it is no part of the plan of the management to make it a bazaar for imported wares or a show place to please merely curious visitors. Foreign exhibits likely to be instructive to Japanese manufacturers and artisans have not been refused, and in the Samples Building are fairly displayed, but they are not the feature of the exhibition, nor does their presence fulfill any part of its purpose. The commissioners have spent 1,000,000 yen (about $498,000) to the best possible advantage, and not a coin of it has gone simply to make the show attractive to those for whom it has no educational value. The Japanese do not take their pleasure in that form. Probably very few people, comparatively, outside of Japan will ever have heard of the Osaka exposition, or, if they do, will realize what it means in its conspicuous differences from the European and American expositions, which are educational not by intention, but because they cannot avoid being so for some of those who visit them.

CORRESPONDENCE.

The Baby Converter for Steel Castings.

To the Editor: In your issue of May 22, 1902, there appeared an article by H. H. Campbell, ridiculing the small "Baby" converter for making steel castings, to which the undersigned replied in your issue of June 5, 1902. The writer of the article of May 22 could not, or at least he did not, answer to the public at large, but in the early part of this year he published a book called "The Manufacture and Properties of Iron and Steel," where appeared, on page 593, an answer to *The Iron Age* article of June 5, which read as follows:

"Within the last few years there has been a revival of Bessemer castings, due to special developments along certain lines of procedure which have been practiced in exceptional cases for many years. After the drop of the carbon flame a certain amount of melted ferro-silicon is added to the bath and the blowing resumed. The silicon is oxidized, and produces a very high temperature, and the advocates of the small converter lay great stress upon this feature. Thus in an article in *The Iron Age*, June 5, 1902, a writer, who claims to be skilled in open hearth practice, states that the small converter will make steel containing only 0.10 per cent. of carbon, with a trace of manganese and silicon, while 'an open hearth furnace cannot make this grade at all, and it could not be kept liquid in the ladle.' This is a complete mistake, for several open hearth plants have made large quantities of such metal. In fact, it is not up to date to talk about a steel containing 0.10 per cent. of carbon as being extra soft, for the Pennsylvania Steel Company, as well as other works, stand ready to deliver any amount of blooms or billets with carbon below 0.04 per cent., with a trace of manganese and silicon, and low in phosphorus and sulphur. It has been deemed necessary to refer to this communication because it is the most recent and because it is characteristic of a thousand similar advertisements continually appearing in the news columns of the technical press. It is essential to keep in mind that there is no difficulty at all in a good open hearth furnace in making steel just as hot as can be wanted; in fact, considerable care

must be exercised to keep the metal from being too hot. On some kinds of work an excess of temperature may not cause trouble, but in other cases the open hearth furnace offers far better opportunities for that complete control of temperature and casting conditions which is so desirable and so essential."

If Mr. Campbell will refer again to my article of June 5 he will see that I did not say that the basic open hearth people could not make blooms or billets of that analysis, for we were discussing metal for steel castings, but distinctly stated the open hearth steel casting people could not make a casting of that analysis that would finish up perfectly solid and free from blow holes, and it is like child's play to ring in that the Pennsylvania Steel Company stand ready to deliver any amount of blooms and billets of that analysis when any one in the steel business knows quite well that it is easy to do so. This is begging the question, and I assert again that they cannot produce an open hearth steel casting that will finish up perfectly solid with the following analysis: Carbon under 0.10; silicon, 0.01; manganese, only a trace, and I have a letter in my possession from the Pennsylvania Steel Company, of which Mr. Campbell is general manager, regretting their inability to make castings of that character, which reads as follows:

"In regard to your request for motor frames and pole pieces, beg to state that we are not prepared to quote you on this material to the specifications submitted with your inquiry."

I also have a number of letters from the principal open hearth steel casting firms, who come out plainly and claim that metal of that character cannot be made, yet we are making tons of it every week by our Bookwalter "Baby" converter process. Furthermore, we can make any other grade of high or low carbon steel, and we can use as high as 70 per cent. of scrap and still obtain good results, and have never had a defective casting made of that metal returned, as they finish up perfectly solid.

On page 593 of his book Mr. Campbell says that "after the carbon flame drops" we add a certain amount of ferrosilicon, and resume blowing to obtain a high temperature, and that we lay great stress upon the feature. For his benefit let me inform him that we do not. We merely take sufficient metal from the cupola, run it into the converter, and when it is properly cooked we turn down the vessel and add extra additions, sometimes in the converter, at other times in the ladle, according to the metal we want to make; but after the carbon flame once drops we never resume blowing. If we did as he claims we would merely burn unnecessary metal and have an accumulation of slag instead of good steel. He also says, on page 593, that they can make good steel without manganese or silicon, yet turn to page 595 and he states the elements to procure solidity are silicon, manganese and aluminum, and on page 596 that the proper amount of manganese for steel castings should be from 0.70 to 0.80, and silicon from 0.10 to 0.35. On page 598 he gives the analyses of about 20 open hearth heats of the Pennsylvania Steel Company that will average about 0.30 silicon, 0.65 manganese. Now any fair minded person, practical or not, can see that his statements in different parts of his book contradict one another. The proof of the pudding is the eating thereof, and my first proposition is still open. Come see us do it and bring your friends; there is nothing mysterious about it, only a little practice and good judgment.

SELDEN S. DEEMER,
Superintendent Brylgon Steel Casting Company.
READING, PA., April 27, 1903.

D. H. McAbee of Indianapolis, State Factory Inspector of Indiana, is getting results from efforts to have large manufacturing concerns provide bathing facilities for employees. Reeves & Co. of Columbus have put in bathing equipment in two factories where 600 men are employed, and the Blount Plow Works of Evansville will have an additional building that will furnish bathing facilities, as well as lunch, reading room, &c. Some Indianapolis factories were the first to be thus equipped.

Notes on the Ammonium Molybdate Precipitation for Phosphorus.

BY J. WM. BEATTY, SWEET'S STEEL COMPANY, SYRACUSE, N. Y.

In view of the disagreement that exists between authorities in the matter of the amount of confidence to be placed in the ammonium molybdate precipitation of phosphorus, some results recently obtained in this laboratory may be of interest to chemists engaged in the analysis of iron and steel.

For some time I have doubted that the separation was as great a bugbear as has been supposed, and to satisfy myself a series of determinations of the phosphorus in a piece of Bessemer steel were made in differing menstrua. Nitric acid, hydrochloric acid, ammonium nitrate with free nitric acid, ammonium chloride with free nitric acid, and ammonium chloride with free hydrochloric acid were the solutions in which the precipitations were made, and the results obtained seemed to justify the publication of the experiments.

In all the tests 2 grams of the steel were taken, and the precipitation was made by the addition of 75 c. cm. of the molybdate of ammonium solution, with agitation for five minutes in the case of the nitric acid solution and for ten minutes in the case of those where the free acid was hydrochloric. The flasks were allowed to stand until the precipitate had settled completely, so far as could be judged by the eye.

In the cases of the nitric acid and the ammonium nitrate solutions this time was comparatively short, while in that of the ammonium chloride plus nitric acid it took about five hours, and in the solutions where only hydrochloric acid was present the flasks were allowed to stand over night and the filtrations were made next morning.

In the tabulated results the first three of each group were washed with 2 per cent. nitric acid and weighed. The other two were titrated by the alkali-acid method. In the nitric acid solutions the carbonaceous matter was destroyed by potassium permanganate and the manganese dioxide cleared up with ammonium bisulphite. When the solution of the steel was made in hydrochloric acid the carbonaceous content was destroyed by evaporation to dryness and baking on the hot plate. The residue was taken up with hydrochloric acid and water and the silica filtered off. The filtrate was then used for the determination of the phosphorus. The results are expressed in percentage terms:

HNO_3 only, down in 40 minutes, stood 1 hour	0.0631 0.0623 0.0630 0.063 0.064	Average 0.0631
HNO_3 plus NH_4OH to deep amber color, stood 30 minutes	0.0627 0.0631 0.0640 0.064 0.064	Average 0.0636
HCl plus NH_4OH to neutralization and cleared with HNO_3, stood 5 hours	0.0647 0.0643 0.0651 0.065 0.065	Average 0.0648
HCl plus NHOH till precipitate formed, cleared with HCl, stood 15 hours	0.0630 0.0634 0.0652 0.066 0.066	Average 0.0647
HCl only, stood 15 hours	0.0622 0.0613 0.0645 0.063 0.065	Average 0.0632

The molybdate of ammonium solution used was made as follows: 80 grams molybdic acid free from alkali molybdates was dissolved in 375 c. cm. of ammonia water of 0.960 specific gravity, and this was poured into 1125 c. cm. of nitric acid of 1.20 specific gravity.

After noting the results the conclusion reached was that the ammonium nitrate present in the molybdate solution was sufficient in quantity to cause the reaction in such a satisfactory manner. I then made an ammonium molybdate solution, using hydrochloric acid of the same percentage strength in place of nitric acid. The menstrua were ammonium nitrate, ammonium chloride and hydrochloric acid, and the results were in each case as eminently satisfactory as when the nitric acid solution was used, except that the precipitate was finer in grain and required a considerably longer time to deposit completely,

as long as 48 hours being necessary to obtain a perfectly clear supernatant liquid in the case of the ammonium nitrate and ammonium chloride solutions. These determinations were made on a piece of basic open hearth steel with a phosphorus content of 0.032 per cent., and in no case was there a variation of as much as 0.002 per cent., the largest being between 0.0318 per cent. in the ammonium nitrate solution and 0.0332 per cent. in the hydrochloric acid. The composition of the precipitates was not determined, but seems to have been fairly constant or the percentage results would have varied more.

At my request Mr. Pardee of the Sanderson Steel Works made several determinations on the same samples used by me, and secured very closely agreeing results in both nitric and hydrochloric acid solutions, using a molybdate solution in nitric acid.

The results seem to point to the fact that ammonium chloride is as good a menstruum for the separation as ammonium nitrate, and that when much free acid is present hydrochloric is equally satisfactory with nitric.

Marine Engineering

Hollow versus Straight Lines for Ships.

LONDON, May 16, 1903.—The paper read by Admiral FitzGerald at the spring meeting of the Institution of Naval Architects raised a very important question in naval architecture. A good deal of discussion has, in consequence, followed upon this highly controversial subject. It would seem as if the theorists and the practical seamen (aided by Professor Biles) are in conflict. The "County" class of British cruisers is built with hollow lines. It is contended that the ships cannot fail to be "wet" in consequence. The scientific bearing of the problem has been admirably stated by Professor Biles, who has made some interesting experiments in Denny's tank at Dumbarton. Forms similar to the "County" class, with and without lines, were tested with the following results:

	Hollow lines. Cruiser stem.	Straight lines. Cruiser stem.	Straight lines. Nearly square.
Dimensions	440 x 66 x 24.5	440 x 66 x 24.5	440 x 66 x 24.5
Speed	23 knots.	23 knots.	23 knots.
Displacement	9,880 tons.	10,545 tons.	10,640 tons.
Indicated horse-power	20,440	23,760	24,200
Gain in displacement		665 tons.	760 tons.
Weight of machinery due to extra I. H. P.		285 tons.	325 tons.
Weight of coal due to extra I. H. P.		100 tons.	115 tons.
Difference in I. H. P.		3,320	3,780
Balance gain		280 tons.	320 tons.

Professor Biles points out that the gain in displacement may be made use of in many ways. Armor may be thickened; armament increased; boilers may be made cylindrical, instead of water tube, or speed may be increased; but, inasmuch as the question has been raised more in relation to speed than anything else, it may be desirable to say how much extra speed can be obtained with, say, 280 tons of machinery of the same type. This is about equivalent to 3000 indicated horse-power, which would add about six-tenths of a knot to the maximum speed. Hence it may be said that hollow lines mean the sacrifice of six-tenths of a knot in smooth water. It is, however, to be noted that such a change from hollow to straight lines would involve a loss of about 1 foot of metacentric hight. The Professor concludes:

> We see, therefore, that hollow lines are not necessary for speed in smooth water, though the straight line ship would be more costly. Now we come to the question upon which the naval officer ought to be able to give an authoritative opinion—is the straight line or hollow line ship the better in a seaway? Does the hollow line ship lose more speed in a head sea? Upon these important points Admiral FitzGerald gives a decided dictum that the straight line ship is the better. This opinion, in my experience, is generally held by sailors, and it is one which, for theoretical reasons as well as from practical experience, I am disposed to lean to. What do the naval officers generally say on this question?

Professional seamen, such as Admiral M. Culme Seymour, Admiral J. O. Hopkins, as well as Admiral Penrose FitzGerald, indorse Professor Biles' attitude on the question from their practical experience.

Armor Plate Trials.

A fortnight ago, at the Admiralty proof sales at Portsmouth, a 9-inch armor plate made by Vickers, Sons & Maxim was officially tested. Four 380-pound projectiles were fired at the plate from a 9-inch gun, with varying velocities. Each round the projectile broke up on impact with the face of the plate; the plate itself was not perforated.

The Development of Armor Plates.

The following short sketch of the development of armor plates may prove of interest:

Since its introduction in 1855 for the protection of ships of war armor has undergone many changes. The plates first employed were of wrought iron, a comparatively soft but tough material, which was ultimately completely defeated by the chilled iron Palliser projectiles introduced for the purpose. Early in the eighties wrought iron was superseded by both steel and compound armor. The latter, which was composed of a wrought iron back, to which was welded a hard steel face, presented the ideal combination of a tough body to hold the plate together and a hard surface to resist penetration.

Compound armor was largely used in England, and also by the Italians, Germans and Russians, but the tendency in France and the United States was always toward the all steel plate, and this eventually took a decided lead of its compound rival. This was shown by experiments at Spezzia in October, 1884, and more conclusively in the autumn of 1890 during competitive trials at Annapolis and Ochto. As chilled iron projectiles failed against the foregoing type of armor, forged steel projectiles were introduced, and the gun was again getting the better of the plate when, in 1891, various inventors introduced methods of surface hardening, the best known of these being those of Harvey and of Tressider. Mr. Harvey's method consisted of carburizing the surface of a suitable steel plate and subsequently water hardening it, the result being a plate with an intensely hard surface, which broke up projectiles on impact. It possessed the merits of the compound plates—viz., a hard face and a tough back—without the great defect of those plates, a tendency for the face to crack and become detached from the wrought iron body. The relative resisting values of wrought iron, compound or all steel and Harveyized plates may be given roughly as 1, 1.3 and 2.

Between 1880 and 1893, in consequence of the extreme thickness of compound or wrought iron required to give adequate protection to battle ships against the powerful ordnance then employed, their armor was necessarily very limited in area, and notable examples of ships with thick and small armored patches are the "Inflexible" and the "Admiral" class. Consequently, although armor piercing projectiles were necessary for the attack of these thick plates, the greater part of the ship was unarmored and exposed to the attack of common shell. The secondary guns were quite unprotected, or protected only partially, and the introduction of quick firing guns and high explosive shell made the prospect of an engagement anything but pleasant to the men behind the guns. However, the adoption of Harveyized armor made it possible to double the armored area, and the secondary guns, as well as the primary, were afforded protection. The "Majestic" class were the first British battle ships to employ Harveyized armor, and a glance at the plans of the "Majestic" and "Inflexible" will serve to illustrate the gain in protection due to the adoption of the Harvey process. Of course, some of the additional protection was gained by the greater displacement of the later ships.

Harveyized armor, however, was destined to be soon superseded by the Krupp product, made by an analogous but improved process, which gave an equally hard face and a tougher body to the plate. Two distinct classes of Krupp plates are made, cemented and noncemented—K. C. and K. N. C., for short. Both are oil or water hardened, but the latter is not carburized on the surface. K. N. C. is reported to be very variable in its behavior, its average figure of merit compared to wrought iron being probably about 2.25. The figure of merit of K. C. varies with the thickness of the plate. With the 6 to 9 inch plates it may be anything from 3 to 2.5; with plates over 9 inches

it averages about 2.2. It is found difficult in practice to get uniform results with K. C. armor under 5 inches in thickness, more particularly where the surface of the plate is curved, as in the case of casemates, and in this and similar instances K. N. C. plates are mostly used.

The steel employed in modern armor is not a simple compound of iron and carbon, but is alloyed almost invariably with nickel and very often with chromium. Nickel has the effect of toughening the steel, while chromium exercises a hardening influence. Till recently all steel plates have been pressed or forged, but Krupp exhibited at Düsseldorf last year some cast steel armor which was apparently every bit as good as forged steel, and had the advantages of comparative cheapness and adaptability to curved structures, such as turrets or casemates.

Pneumatic Riveting.

It has been observed during the last few years that steamers engaged in the Atlantic trade, when in the repairing ports, have shown bad cases of defective riveting. The growing thickness of the material, of course, necessitates larger rivets, and these, it is contended, it is beyond the power of man's muscle to drive home satisfactorily. British shipbuilders are not yet entirely satisfied with pneumatic riveting, but recognize that its defects will soon be remedied. It was reported a week or two ago that the large American owned and built steamer "Kroonland," 12,750 tons gross, after running from July, was placed in dry dock at Southampton, and was then critically examined by the chief surveyor and his staff. The rivets, which had all been driven pneumatically, were found in perfect order, even in those places which, considering the nature of the weather the steamer had come through, might have been exepcted to have shown symptoms of movement or leakage. It would therefore seem that the Americans, in yards such as Cramp's, where the steamer was built, are able to work the machines to a greater advantage than has yet been acquired in this country.

Speed of German Cruisers.

Germany is practically the last of the first-class naval powers which has refused to accept the dictum that speed is one of the most important qualities in the modern cruiser, and in their recent ships, while they have attained on limited displacement a high gun power with fairly good armor protection, the speed has been very low —18 knots, as compared with the 22 and 23 knots sought by all other powers. The result of the recent German maneuvers has been to enforce the importance of speed, and it is a significant fact that the authorities are now determined to increase the machinery power by adding to the weight of the engines, &c., as well as to the coal capacity.

Should this require an addition to the total displacement in excess of the possibilities prescribed by financial considerations, there are those who advocate a decrease even of the artillery, as it is contended that the armored cruiser cannot take a place in the line against modern battle ships, and it is better to have a fast, effective cruiser than a weak line-of-battle cruiser. There is therefore a prospect of the design of the new cruisers being modified in this direction. One such ship is contemplated in this year's programme, the "Ersatz Deutschland." There will also be laid down this year two battle ships, one of the "Braunschweig" type at Dantzig, and another of a modified type at Kiel. Three years are allowed for the completion of these and two years for a small cruiser to be built at Bremen, a river gunboat, and several destroyers.

Turbines for a Cruiser.

The most interesting of the war vessels building in Germany are two third-class cruisers, which will be built side by side, identical in form and boiler equipment, the only difference being that the one will have twin screw reciprocating machinery, while the other will have steam turbine machinery driving four shafts, the turbine being so arranged that they may work at two, three or four stages of expansion, according to the amount of power required. This, it is hoped, will improve the economy at low powers. The two ships will be tried under the same conditions over the same course at the same time and at approximately the same speeds. The ships' lines and resistance being the same, it will be clearly demonstrated how the coal consumption of the two systems of marine propulsion compares. Comparative progressive speed runs will be made under the same conditions, and valuable data is certain to be got. S. G. H.

The St. Louis Labor Situation.

(By Telegraph.)

St. Louis, Mo., May 27, 1903.—About 4000 men, representing the different crafts of metal workers in St. Louis, including machinists, blacksmiths, blacksmiths' helpers, molders' helpers, metal polishers, &c., went on a strike Wednesday afternoon, May 20, because their demands for a 10 per cent. increase of wages and arbitration of the whole agreement was not conceded by their employers. The shops affected were very generally in favor of submitting all matter to a board of arbitrators, and pending a final settlement a preliminary increase of 6 per cent. in wages was offered the men and refused. The Metal Trades Association, representing 70 firms, employing, it is stated, about 95 per cent. of the labor, sent out the following communication on May 20 to the employees: "Have received from some of our employees a demand for a 10 per cent. increase in wages. Concerning that request we wish to explain that we have offered an increase of 6 per cent. and have further offered to submit this or any other difference to arbitration. The Machinists' and Brass Workers' Union have refused all offers of arbitration with our association. In order to act fairly and intelligently on the wage question, we have sent inquiries and received reports from employers in a large number of leading cities and have found that the present wages paid in St. Louis are materially higher than paid in other localities. In offering an advance of 6 per cent. we have aimed to be liberal. We ask that our employees remain at and return to work and submit any matters in dispute to a board of arbitration. An unexpired agreement the association have with the iron molders might prevent their going on a strike of their own accord, but the strike of the helpers has forced a large number of them out." Meetings are being held daily of employers and employees, but both hold strongly to their original position.

The foundries of the Andrew Terry Company, manufacturers of malleable iron castings at Terryville, Conn., are shut down temporarily because of the strike of some 90 molders Monday. An attempt had been made to unionize the foundries. The company objected, and on Saturday six men were discharged, three of whom were slated for offices in the union. A committee of molders waited upon the company and demanded that these men be reinstated. The demand was refused absolutely, and the molders returned their patterns and left their benches. One of the foundries could have been started on the 26th, for enough of the strikers had already regretted their action and were willing to return to work with those molders who had declined to enter the movement against the company. But as there were repairs needed the company decided to take this opportunity to make them. It is confidently expected that the foundries will be in operation again in a few days.

The large manufacturing establishments of Waterbury, Conn., with hardly an exception outside of those companies operating on a nine hours' schedule, have notified their employees that during the summer months, until September 1, they will be given a half holiday Saturday afternoons, with full 60 hours' pay. This experiment was tried last year, and was a success, and it was decided to do the same thing this year. Some concerns began the operation of the new rule last Saturday, and the others will begin this week. The only companies in the city running on a nine hour schedule of wages are the manufacturers of machine tools. The Hendee Machine Company of Torrington, Conn., have posted a similar notice in their shops, the Saturday half holiday to continue through June, July and August, and to begin the first

Saturday in June. In all this the understanding is that the employee must have worked the full week to Saturday noon in order to be entitled to the full 60 hours' pay.

MANUFACTURING.

Iron and Steel.

The management of the Inland Steel Company report that the equipment recently installed at their new plant at Indian Harbor, Ind., is working satisfactorily, permitting an increase in the tonnage of bars, plates, sheets and billets manufactured.

The Republic Iron & Steel Company are installing a new gas producer system at their East Chicago plant, which has been closed pending a settlement of labor difficulties. It is announced that at the Springfield plant double turn was commenced on Monday, May 25.

The Lalance & Grosjean Mfg. Company's tin plant at Harrisburg is enjoying unusual prosperity. The demand for tin plate is large and the summer shutdown will be much shorter than usual.

The Cambria Steel Company are rebuilding their No. 6 blast furnace at Johnstown, replacing the old 275-ton stack with one 22 x 85 feet in dimensions, with a capacity of 400 tons of pig iron per day. McNeil Bros. of Pittsburgh have been given the contract for the plate work. The furnace will be blown in August 15. Webster, Camp & Lane of Akron, Ohio, are building two large ore bins at Nos. 1 and 4 furnaces.

The work of installing electric motors and machinery in the new pipe mill of the Susquehanna Iron & Steel Company of Columbia, Pa., has been started. The American Bridge Company have almost completed the several buildings for which they have the contract.

The new open hearth works of the Sharon Steel Hoop Company, at Sharon, Pa., will be in full operation this week. The plant contains four 30-ton furnaces and a 12-inch and 22-inch billet mills. The plant is expected to turn out 225 tons of open hearth steel per day, of which 125 tons will be used in the manufacture of cotton ties, steel hoops and bands, the other 100 tons being sold in the open market. This plant is equipped to roll steel billets from 1¼ to 4 inches square of any carbons desired.

Under the laws of Illinois a corporation doing business in that State with headquarters in another State must take out a charter in both States. For this reason the Jones & Laughlin Steel Company have taken out a charter in the State of Illinois. The capital subject to taxation is $385,000. This covers the operations of the company's sales department in Chicago. Since 1857 the Jones & Laughlin Steel Company have maintained a large branch warehouse and selling offices in Chicago and carry in stock in that city a full line of their products.

No. 1 Furnace of the Clairton Steel Company, Pittsburgh, continues to make some excellent records for production. This furnace is only 85 feet high and is running on practically all Mesaba ore. The furnace is turning out from 490 to 530 tons of pig iron every 24 hours. As soon as all the equipment of the furnace is working smoothly the product is not expected to go at any time below 500 tons, and eventually the stack is expected to turn out very close to 550 tons per day.

The Dover Forge & Iron Company have been organized at Canal Dover, Ohio, by electing the following directors: Ambrose Beard, F. H. Waldron, A. Weiss, H. W. Enck, James Rees, L. P. Wentz, C. F. Baker. The officers named by the directors are A. Weiss, president; H. W. Enck, vice-president; Ambrose Beard, secretary, and Chas. F. Baker, treasurer. The new company will erect a plant to manufacture muck bar, scrap bar and refined bar iron. They expect to gradually develop into other lines not in competition with existing industries in the locality of the new plant. The site for the new works will probably be in Tintown, near where the tin plate mill of the American Tin Plate Company was formerly located, but which was removed some time since to other works.

The Greenville works of the Shelby Steel Tube Company, at Greenville, Pa., have recently installed machinery for the manufacture of weldless steel tubing under a new process, which it is claimed considerably reduces the cost of manufacture.

The Ohio works of the Carnegie Steel Company, at Youngstown, Ohio, which have been on billets, sheet and tin bars for several months, will go on rails again, commencing Sunday night, May 31.

The Damascus Steel Company of Des Moines, Iowa, who were recently organized for the manufacture of Damascus steel by the Dawson process, are now established in their new plant at New Brighton, Pa. The product is steel castings, die steel and tool steels. C. C. Taft is president, J. B. Burton treasurer and A. M. Haggard secretary.

Franklin, Pa., has received an addition to its manufacturing industries: the Franklin Rolling Mill & Foundry Company, whose new factory buildings are nearly completed. The company will make tripartite steel poles for trolley, telephone and telegraph lines, besides various other steel products. Between 250 and 300 men will be employed.

At the recent annual meeting of the Woodward Iron Company of Woodward, Ala., at which it was decided to erect another furnace, the following officers and directors were elected: J. H. Woodward, president; R. H. Banister, secretary; S. Hine, treasurer; G. B. McCormack, A. H. Woodward, W. T. Bert, J. M. Vance, F. J. Hearn and S. Woodward.

The management of the De Kalb Fence Company of De Kalb, Ill., one of the constituent plants of the National Steel & Wire Company of New Haven, Conn., having experienced considerable difficulty in obtaining castings promptly are utilizing a portion of one of their present buildings as a foundry for making machine castings preparatory for the new equipment which will be installed in the fall. It is also contemplated to erect a new warehouse and possibly some other improvements will be made in the autumn.

No. 1 furnace of the Ohio works of the Carnegie Steel Company, Youngstown, Ohio; Struthers Furnace of the Struthers Furnace Company of Struthers, Ohio; Hannah Furnace of the Republic Iron & Steel Company, at Youngstown, and the small blast furnace of the North Side Iron Company, at Sharpsville, Pa., are all out of blast while repairs and improvements are being made.

At the Bellaire Works of the Carnegie Steel Company, at Bellaire, Ohio, there was recently turned out 960 tons of Bessemer ingots in 12 hours.

General Machinery.

The Griswold Mfg. Company, Erie, Pa., expect to purchase the motors for their new plant from the Westinghouse Electric & Mfg. Company of Pittsburgh, who secured the order for the generators. All other equipment has been secured.

The American Frog & Mfg. Company, 302, 303 New England Building, Kansas City, Mo., advise us that they are in the market for the complete equipment for the extensive switch and frog works, foundry and machine shop they are erecting on the property formerly occupied by the Cookson Mfg. Company and the Kansas City Switch & Frog Works, which they recently purchased. The American company are being organized with a capital stock of $250,000, and besides the manufacture of railway, mine and mill machinery they will handle general railway supplies and material. F. W. Fritchey is vice-president and general manager, and J. E. Murphy is manager of sales.

The United Engineering & Foundry Company of Pittsburgh installed last year a complete heating and ventilating equipment in the roll shop of the Lincoln Foundry Department. The apparatus, which was furnished by the B. F. Sturtevant Company, consists of a steel plate exhauster direct connected to a horizontal side crank engine. The exhauster draws air from out of doors through a large steam heater built up in sections of 1-inch pipe, one of the sections receiving the exhaust from the fan engine.

The American Blower Company of Detroit, Mich., report business excellent in all lines. Among the larger orders recently received they mention heating and induced draft apparatus for the Ironton Engine Company, Ironton, Ohio; drying outfits for the Illinois Sugar Refining Company, at Pekin, Ill., and the Michigan Starch Company at their Traverse City plant; dry kiln for the Mengel Box Company of Louisville, Ky.; Brooklyn Cooperage Company of New York, Buckstege Furniture Company, Evansville Desk Company, both of Evansville, Ind.; Cadillac Cabinet Company, Detroit, and many others.

It is stated that the Jenkes Machine Company of Sherbrooke, Que., who have a $400,000 contract for castings and machine work for the Ontario Power Company of Niagara Falls, Ont., will establish an extensive plant at Chippewa, just above the falls, eventually moving their entire business to that point, an important factor in the removal being the superior transportation facilities of the Niagara frontier.

The Erie Forge Company of Erie, Pa., have been reorganized and the capital stock increased from $100,000 to $150,000. Among the new stockholders are Robert F. Devine, a steel manufacturer of Elmwood City, Pa.; George Stout of the same place; Joseph P. Campbell, Wonaca, Pa.; Charles R. Eckert, Beaver, Pa., and J. H. Philips, Rochester, Pa. J. P. Harrington of Erie retains his interest in the company.

The Fort Worth Machine & Foundry Company, successors to the Fort Worth Iron Works, Fort Worth, Texas, put their new plant in operation April 27. The new company have been operating the old works for about a year, and have been so successful that they intend to erect an extensive addition to their new plant, which is already very much larger than the former one.

The additions to the plant of the Bryant Electric Company of Bridgeport, Conn., will consist of two buildings, one 160 feet long and three stories, the other 161 feet long and one story. The company recently enlarged their power plant and have all the engines, boilers and equipment of that character that they need.

The Excelsior Machine Works, Wellston, Ohio, are erecting a new plant. The equipment was secured from Chicago houses.

The Prentice Bros. Company of Worcester, Mass., are going into the manufacture of larger engine lathes and have already extended their line by the addition of a 26 and a 32 inch lathe. Previously their largest size was 24-inch.

Power Plant Equipment.

Sales of the Allis-Chalmers Company of Chicago for April include American Steel & Wire Company, Shoenberger works, Pittsburgh, 46 and 84 x 60 vertical standard long crosshead Bessemer blowing engine, 80 and 84 x 60 vertical standard L. P. furnace blowing engine; El Oro Mining & Railway Company, Limited, Mexico, 20 and 40 x 42 1890 tandem compound Reynolds Corliss engine; Kingsford Foundry & Machine Works, Oswego, N. Y., 20 and 14 x 42 1890 half-duplex air compressor; Wheeling Steel & Iron Company, Wheeling, W. Va., 44 and 84 x 60 vertical standard blowing engine; Jones & Laughlin Steel Company, Pittsburgh, pair 44 and 84, 84 and 84 x 60 vertical standard compound disconnected blowing engines, 44 and 84 x 60 horse-power engine, three 46 and 85, 84 and 84 x 60 vertical steeple cross compound condensing furnace blowing engines; C. A. McDonald, Chicago, 12 and 22 x 36 tandem compound engine; Highland Park Mfg. Company, Charlotte, N. C., 30 and 64 x 60 1890 cross compound engine, with boilers; City of Ely, Minn., 14 and 28 x 36 1890 frame cross compound Reynolds Corliss engine; Charles Pope, Chicago, two 12 x 36 and 18 x 36 1890 frame horizontal Reynolds Corliss engines; National Tube Company, at McKeesport, Pa., three 46 and 86, 84 and 84 x 60 vertical steeple cross compound furnace blowing engines; Carnegie Steel Company, Pittsburgh, two pairs 44 and 84, 84 and 84 x 60 vertical standard disconnected compound blowing engines; National Steel Company, Pittsburgh, two 50 and 96, 96 and 96 x 60 vertical steeple cross compound furnace blowing engines; Smeeth's Copper & Bronze Company, Chicago, 14 and 28 x 24 vertical cross compound condensing direct connected engine, 12 and 24, 12 and 20 x 36 air compressor; Construction Company of America, New York, two 20 and 40 x 42 1890 frame horizontal cross compound Reynolds Corliss engines; one 16 x 36, 10 x 30, 24 x 48, 18 x 36, 14 x 36, 10 x 36 girder frame Reynolds Corliss engines; two 20 x 36, 32 x 48, 20 x 42 and one 16 x 36, 22 x 48, 12 x 36 1890 frame Reynolds Corliss engines.

The Warren Steam Pump Company, Warren, Mass., have voted to increase their capital stock from $100,000 to $150,000.

The municipality of Cameron, Mo., have engaged an engineer to prepare plans and specifications for a water works system. O. M. Young is mayor.

Bids are asked until June 8 for the construction of an electric light and power system for New Orleans, La. W. J. Hardee is city engineer and V. Tujaque comptroller.

Bids are asked until June 8 for pumping plant and improvement of water supply at Schenectady, N. Y. H. S. Van Voast, water commissioner.

Jerry Redfern, C. E., Lancaster, Ky., wants prices on two 40 horse-power boilers, two 250,000-gallon pumps, standard make; 60-foot steel tower, 226 tons of 8-inch, 78 tons of 6-inch and 53 tons of 4-inch water main.

The City Council of Dillon, Mont., will receive bids until June 10 for a water works system.

Bids are wanted at once by Caledonia, Minn., for furnishing the following for an electric light plant: 125 horse-power engine, two 80 horse-power boilers and two 40-kw. dynamos. Jerry Kenny is village recorder.

The Penn Facing Mills, Irwin, Pa., will shortly be in the market for a 150 horse-power engine. They advise us that they will rebuild their plant, which was recently destroyed by fire, some time this summer, and have not as yet bought the equipment that will be required. The boilers were not damaged.

The Burrows Mfg. Company, a new industry of York, Pa., have entered into a contract with the Pennsylvania Steel Company of Steelton, to fit all the boilers of that industry with automatic boiler feeds and damper regulators. The contract is one of the largest that has been booked by the Burrows company since organization.

At a meeting of the directors of the Harrisburg Boiler & Mfg. Company, Harrisburg, Pa., the proposition to increase the capital stock by $50,000 was approved. The money derived from this sale of stock will be used for enlarging and increasing the capacity of the plant. Large and growing foreign business is mainly responsible for the increase of capital. The company are rebuilding the main building of the plant, which was destroyed by fire several months ago. It is not proposed to use much of the new capital for rebuilding purposes.

Bids will be received about July 4 for a 1000 horse-power electric plant to be located two miles above Noblesville, Ind. The plant is to be operated by water and will cost about $80,000. Six 280 horse-power turbines, generators and accessories will be required. The Beardsley Gravity Dam Company, R. C. Beardsley, president, Elkhart, Ind., are the designing engineers.

Foundries.

The Westinghouse Foundry & Machine Company, Wilmerding, Pa., have purchased the foundry heretofore operated by M. R. Zahniser. Among the orders already secured is one for two 20-ton steel castings for the Niles-Bement-Pond Company.

The Bethlehem Steel Company of Bethlehem, Pa., last week turned over to the Lehigh Valley Railroad Company for shipment to the Carnegie plant at Homestead, Pa., a railroad car on 32 wheels, 103 feet long, carrying two steel castings weighing 227,000 pounds. The castings are said to be the largest single shipment of the kind ever made. The metal extended on either side of the car so far that other trains could not be passed on curves.

The foundry formerly operated by M. Darragh & Co. at West Bridgewater, Pa., has been sold to Grove & Knox, machinery dealers, Farmers' Bank Building, Pittsburgh. The plant is idle, but will be considerably enlarged by the new owners and put in operation in a short time.

Fires.

The Old Colony Iron Foundry & Machine Shop, East Bridgewater, Mass., with several other buildings, were burned May 21. The total loss is placed at $100,000.

The electrical supply works of the Chase-Shawmut Company, Boston, Mass., were damaged $30,000 by fire May 2.

The brass foundry of Robert Mitchell & Co., Montreal, Canada, was destroyed by fire May 24, entailing a loss of $150,000.

The ice manufacturing plant of the American Ice Company at Philadelphia, Pa., was destroyed by fire May 25, causing a loss of $200,000. It is stated that about $150,000 worth of machinery is practically ruined.

The Waterous Engine Works, St. Paul, Minn., were destroyed by fire May 22. It is estimated that the loss will reach $75,000.

Moore Brothers' foundry, at Elizabeth, N. J., was seriously damaged by fire May 20.

The plant of the George W. Blaban Company, manufacturers of oil cloths, at Philadelphia, Pa., was damaged $75,000 by fire May 20.

The main mill of the Diamond State Car Spring Company, Wilmington, Del., collapsed May 26. The loss is estimated at $10,000.

The fire which swept away over 100 buildings in Laconia, N. H., May 26, destroyed the H. H. Wood Hosiery Mills and the plant of the Laconia Electric Light Company. The loss on the former is $85,000 and on the latter $30,000.

Hardware.

Elliott Mfg. Company, makers of anti-rusting tin, copper and galvanized ware, Warren, Ill., who commenced business three years ago with a capital of $20,000, have recently increased their capital to $40,000 and made additions to the plant which nearly double its capacity. The company state that they make nothing but extra heavy, high grade ware, which they refer to as in good demand throughout the Middle West. This year they have engaged experienced salesmen for the Pacific Coast States, who are making regular trips there and meeting, we are advised, with flattering success. The company have recently installed a large wiring machine of lately improved type, built by the E. W. Bliss Company, which makes it possible to use much larger wire in their pails. They now use nothing smaller than No. 5, and for the larger sizes No. 4, with ¼-inch rods. They make a line of heavy galvanized iron pails from 10 to 20 quarts, and these, they state, hold 1 quart more than indicated, which is true, indeed, of all the pails they make. The company have also added to the quality of their wash boilers by the use of a heavy Bessemer steel and enameled wood handle, on which a patent has been obtained. The company are now about three weeks behind on orders, but with improvements made and under way expect soon to be in a position to ship goods the same week the order is received.

The Taunton Rivet Company, Taunton, Mass., have just occupied a new building, 32 x 42 feet, and two stories high. The company have added tubular and clinch rivets as new lines.

The extensive new plant which the National Wire Corporation are building at New Haven, Conn., is rapidly nearing completion.

Miscellaneous.

The Sugartown Platinum Company of Malvern, Pa., will begin the erection this week of a new brick plant on a lately purchased tract of land. Joseph B. Mattack is president of the company.

The Detroit Sulphite Fiber Company, Detroit, Mich., will replace their plant, recently destroyed by fire, with a large stone, brick and steel structure. About 250 tons of steel and iron will be required. Modern paper mill machinery will be installed.

The Universal Accountant Machine Company, St. Louis, Mo., have increased their capital stock from $500,000 to $750,000, $250,000 of which is 7 per cent. preferred.

M. M. Rogers & Co. of Chicago, manufacturers of Rogers' journal packing, have incorporated under the laws of Illinois, and the erection of a factory on the North Side immediately is contemplated. The officers of the company are M. M. Rogers, president; John C. Adams, vice-president; James Savage, treasurer, and A. C. Rogers, secretary.

The 1000 flat bottom gondola cars with twin hoppers which

the Chesapeake & Ohio Railway Company are having constructed at the McKee's Rocks works of the Pressed Steel Car Company, Pittsburgh, are to be equipped with the C. & O. Standard arch bar trucks, pressed steel bolsters and brake beams, manufactured by the Pressed Steel Car Company, Miner draft gear on 800 of the cars and Sterlingworth draft gear on 200, Chicago frictionless side bearings and Westinghouse air brakes. The Westinghouse Electric & Mfg. Company have ordered 10 flat cars from the Pressed Steel Car Company, to be equipped with structural steel underframing and to have a carrying capacity of 135,000 pounds. The latter company have also received an order from the South Fork Coal Mining Company for 150 self clearing hopper cars of 100,000 pounds capacity, to be constructed at their Allegheny works.

Supplies for Eastern Yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, D. C., will receive bids until June 10 for the following supplies for the Eastern yards:

Class 1. Five 15, six 10 and one 7½ horse-power electric motors.
Class 2. One 15, one 10, two 5, one 3, one 2 and three ½ horse-power electric motors.
Class 3. Eight foundry ladles.
Class 4. Six anvils.
Class 5. One 8-inch by 14 feet and one 4-inch by 14 feet portable cylinder boring bar.
Class 6. Three 52 horse-power water tube steam boilers.
Class 7. Electrically driven 10-foot automatic power brake complete, with motor.
Class 8. Double headed bolt cutter, threading bolts ½ to 2 inches.
Class 9. Sprue cutter.
Class 10. Sprue cutter, direct electric driven, complete, with motor.
Class 11. Universal radial drill, with 4 feet 6 inches arm.
Class 12. Two 42-inch sensitive friction drills.
Class 13. Upright drill, No. 5, 26-inch swing.
Class 14. Six electric sensitive drills.
Class 15. Six-foot electric horizontal boring and drilling machine.
Class 16. Electric centrifugal fan.
Class 17. Two ⅛ to 3½ inch electric twist drill grinders.
Class 18. Three double emery grinders.
Class 19. Direct connected electric emery grinder.
Class 20. Emery grinder for molding bits.
Class 21. Forty-inch automatic planer knife grinder.
Class 22. Twenty-inch water tool grinder.
Class 23. Fourteen-inch electric water tool grinder.
Class 24. Two 18-inch grinder heads on column.
Class 25. Sixteen-inch jointer.
Class 26. Ten-inch bench lathe.
Class 27. Two 14-inch tool room lathes.
Class 28. Sixteen-inch engine lathe.
Class 29. Two 16-inch engine lathes.
Class 30. Two 24-inch engine lathes.
Class 31. Patternmaker's gap lathe, 16-inch carriage swing and 37 inch gap swing.
Class 32. Two buffing lathes.
Class 33. Fourteen-inch patent screw cutting engine lathe.
Class 34. Engine lathe, 20 inches by 8 feet.
Class 35. Engine lathe, 18 inches by 8 feet.
Class 36. Two-spindle centering lathe, ¼ to 4 inches.
Class 37. Sixteen-inch patent screw cutting engine lathe.
Class 38. Triple back geared, hollow, hexagon turrent lathe, with 16-inch swing.
Class 39. Double turrent lathe, with 22-inch swing.
Class 40. Two 16-inch electric lathes.
Class 41. Twenty-eight-inch electric extension lathe.
Class 42. Thirteen-inch speed lathe.
Class 43. Two patternmaker's gap lathes, 50-25 and 37½-21 inches.
Class 44. Saddle tank locomotive.
Class 45. Die slotting machine, 2½-inch stroke.
Class 46. Pipe machine for ½ to 4 inch pipe.
Class 47. Universal milling machine.
Class 48. New model, two spindle centering machine, capacity up to 4 inches.
Class 49. Combined horizontal punching and beam bending machine, for 1⅛-inch holes through 1-inch plates, and bending 10-inch I-beams or channels.
Class 50. Automatic band saw filing and setting machine.
Class 51. Testing machine, 800,000 pounds capacity, 1½-ton traveling crane, hydraulic link cutter, set of steel grippers, 20 horse-power motor.
Class 52. Two tinsmith's grooving machines and tinsmith's roll forming machine.
Class 53. Belt polishing machine, 36 inches long, for 3-inch belts.
Class 54. Jointing and facing machine with 24-inch knives and 7-foot table.
Class 55. Two-spindled upright molding machine with table 48 x 42 inches.
Class 56. Tenoning machine with a capacity up to 6 inches.
Class 57. Boring machine with at least 6-inch stroke, capable of boring 8 inches from stock.
Class 58. Hand feed dowel machine.
Class 59. Electric double seaming machine.
Class 60. Electric wire crimping machine.
Class 61. Electric hammering machine.
Class 62. Extra heavy band saw machine.
Class 63. Cold saw cutting off machine.
Class 64. Thirty-eight-inch band saw machine.
Class 65. Concrete mixer with engine and boiler.
Class 66. Twin head paint mixer.
Class 67. Set of plate bending rolls, upper rolls 5½ inches, lower rolls 4½ inches: length between housings at least 6 feet.
Class 68. Triple back geared slip rolls, electrically driven, 6 inches diameter, 102 feet long.
Class 69. Thirty-inch single surface planer.
Class 70. Twenty-four-inch single surface planer.
Class 71. Dimension planer.
Class 72. Metal planer, 30 x 30 inches by 10 feet.
Class 73. Four-roll surface planer, 24 x 10 inches.
Class 74. Twelve-inch automatic bevel gear planer.
Class 75. Twenty-four-inch upright drill press.
Class 76. Two 24-inch upright drill presses.
Class 77. Thirty-six-inch upright drill press.
Class 78. Inclinable power press.
Class 79. Power press, electrically driven.
Class 80. Power punching press, electrically driven, with 24-inch throat.
Class 81. Blanking press, 24 x 24 inches, electrically driven.
Class 82. Forty-eight-inch power gap punch, electrically driven.
Class 83. Railway automatic circular cutting off saw.
Class 84. Thirty-six-inch band saw.
Class 85. Universal circular saw bench.
Class 86. Two double adjustable saw tables.
Class 87. Magnetic separator for brass filings.
Class 88. Twenty-four-inch pillar shaper.
Class 89. Twenty-four-inch shaper.
Class 90. Thirty-two-inch shaper.
Class 91. Two 16-inch, extension base, "double triple-quick" return stroke shapers.
Class 92. Electrically driven 10-foot power shear.
Class 93. Rotary slitting shear, electrically driven.
Class 94. Open throat cross cut bar shear.
Class 95. Tinsmith's squaring shears.
Class 96. Tinsmith's rotary shears.
Class 97. Double punch and shears.
Class 98. Two steel plate gate shears.
Class 99. Power squaring shear.
Class 100. Three wood trimmers and stands.
Class 101. Six No. 6 bench trimmers, two No. 5 wood trimmers.
Class 102. Magnet winder.
Class 103. Materials and labor for temporary water works.

The International Nickel Company.

The first annual report of the International Nickel Company, covering the fiscal year ended March 31 last, has just been issued. The general profit and loss account for the year shows:

Earnings of constituent companies, not including the Nickel Corporation, Limited, and the Société Minière Caledonienne, and deducting administrative and selling expenses, $1,090,401; interest on advances and deposits, $29,017; total $1,119,418; expenses, $110,025; net income, $1,009,393; interest on bonded debt, $450,244; surplus, $559,149.

President A. Monell, in his report to the stockholders, says that the reports of the Nickel Corporation, Limited, and the Société Minière Caledonienne are being made up in New Caledonia and cannot be had yet. He adds:

The prospects are better than for the year past. The demand for nickel is increasing and copper is now at a much higher price than in 1902. When the new Canadian Company's plant is complete their earnings should add largely to the earning capacity of the property. Every effort is being made to introduce nickel into new fields and to extend its use in old lines, particularly to extend the use of nickel steel. The results have been very gratifying; about 12,000 tons of nickel steel rails, 3¼ per cent. nickel, have been purchased by the American railways, and are nearly all manufactured. Seamless drawn tubes containing a high percentage of nickel have been successfully manufactured, and we look for an important market for these tubes. In addition to this, it is quite probable that within a very short time nickel steel will be largely used in bridge construction.

The New York Building Trades Employers.

The Board of Governors of the new Building Trades Employers' Association of New York met on the evening of May 25 in the Townsend Building and elected permanent officers and adopted a constitution and by-laws in accordance with the power given to it when the association organized. It was said that 28 out of a possible 35 organizations, representing as many branches of the building industry, were represented.

The meeting lasted until after midnight, and every plank in the constitution was discussed before the document was adopted. These officers were elected: President, Charles L. Eidlitz of the Electrical Contractors' Association; first vice-president, L. K. Prince of the Iron League; second vice-president, Hugh Getty of the Master Carpenters' Association; chairman of the Board of Governors, Otto M. Eidlitz of the Mason Builders' Association; secretary-treasurer, William K. Fertig of the Marble Association.

In the new constitution the objects of the association are set forth as being "to foster the interest of those engaged in the erection and construction of buildings and other structures; to reform abuses relating to the business of persons so engaged; to secure freedom from unjust and unlawful exactions; to obtain and diffuse accurate and reliable information as to all matters affecting such persons; to procure uniformity, harmony and certainty in the relations between employers, employees, mechanics and laborers."

The Iron and Metal Trades.

The purchases of Bessemer Pig by the United States Steel Corporation recently made appear to have been about 50,000 tons, for delivery during the third quarter, at $18.50 at furnace, equivalent to $19.35, Pittsburgh, the sellers being the Valley Furnace Association and W. P. Snyder & Co., and about 10,000 to 15,000 tons for May and June delivery at $19 at furnace. This is understood to be on the basis of $3 per ton for Coke, at oven. It is believed that this does not cover the requirements of the corporation, but how much additional tonnage will be required for the third quarter cannot now be closely estimated. It may rise to 40,000 tons. The corporation is believed to be self-contained as to Basic Pig.

In the Eastern markets the only large transaction in Steel making Pig has been the sale of a lot of 10,000 tons of Basic Pig to a plate mill by three furnace interests in the Schuylkill and Lehigh valleys.

There has been little change in the situation so far as Foundry Iron is concerned. Buyers and sellers are apparently far apart. In Chicago the absence of further resales by consumers has created a better feeling. But outside interests are still showing some anxiety and $15 for No. 2 Foundry at Birmingham is being done. A meeting of some of the large Southern furnace interests is to be held at Birmingham on the 1st prox., at which the situation is to be discussed and at which possibly some action may be taken. It may be doubted, however, whether any radical measures will be adopted. While very influential, the group of furnace interests which has been working together is far from exercising any control over the markets.

The influence of foreign Foundry Iron may well be dismissed from a serious consideration of the situation. The cheaper foreign Irons are available to only a few consumers, for a variety of reasons. The higher grades, ranking with the best of our domestic Irons, cannot now be laid down at competitive figures, and the danger that the German syndicate might make a special effort to retain a hold on the market seems remote.

In the Steel market values continue steady. The Ohio mill at Youngstown is to be again switched over to Steel Rails, and the starting of the Hainsworth mill at Pittsburgh is under consideration to help out. One lot of about 6000 tons of German Steel purchased last summer by an Eastern plant, which has not yet started, has been resold, the material going to Pittsburgh.

There has been some talk among the Steel Rail makers of an early meeting to discuss the question of prices for 1904 delivery. It is stated that some of the railroads are getting ready to place orders running into next year.

A very good tonnage is still coming up in Structural Material, in spite of the labor troubles. As showing how large are the requirements for the new plants of the Steel Corporation, we may note that the contract, involving 30,000 tons, for the McKeesport and Lorain plants of the National Tube Company has just been taken by the American Bridge Company.

Interesting negotiations are under way by which large agricultural implement makers expect to arrange for the importation of the special Steel Shapes to be used by them in the manufacture of implements for export, under the drawback system.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	May 27, 1903.	May 2, 1903.	Apr. 29, 1903.	May 28, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$19.50*	$19.50	$21.25	$19.75
Foundry Pig No. 2, Southern, Cincinnati	*18.25*	18.75	19.75	18.75
Foundry Pig No. 2, Local, Chicago	*20.00*	20.00	22.80	21.00
Bessemer Pig, Pittsburgh	*19.85*	20.10	20.35	21.00
Gray Forge, Pittsburgh	*19.75*	19.75	20.25	19.75
Lake Superior Charcoal, Chicago	*24.00*	24.00	25.00	23.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	*29.50*	30.50	30.50	32.00
Steel Billets, Philadelphia	....	28.00	....	34.00
Steel Billets, Chicago	32.50	32.50	32.75	....
Wire Rods, Pittsburgh	37.00	37.00	37.00	37.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*17.00*	17.00	18.50	18.00
O. Steel Rails, Philadelphia	*21.00*	21.50	21.50	21.00
O. Iron Rails, Chicago	*23.00*	23.50	24.50	24.00
O. Iron Rails, Philadelphia	*24.50*	24.50	25.00	24.50
O. Car Wheels, Chicago	*22.00*	22.50	24.00	20.50
O. Car Wheels, Philadelphia	*22.50*	24.00	24.00	19.50
Heavy Steel Scrap, Pittsburgh	21.00	21.00	21.50	....
Heavy Steel Scrap, Chicago	*16.50*	17.00	18.50	18.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	*1.85*	1.80	1.93½	2.00
Common Iron Bars, Chicago	*1.75*	1.75	1.80	1.80
Common Iron Bars, Pittsburgh	1.80	1.80	1.80	1.80
Steel Bars, Tidewater	1.75	1.75	1.75	1.90
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater	*1.80*	1.80	1.85	1.95
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.73½	1.73½	1.73½	2.00
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.73½	1.73½	1.73½	2.00
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh	*2.00*	2.00	2.05	2.22
Skelp, Sheared Iron, Pittsburgh	2.10	2.10	2.10	2.25
Sheets, No. 27, Pittsburgh	2.65	2.65	2.65	2.95
Barb Wire, f.o.b. Pittsburgh	2.60	2.60	2.60	2.90
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	2.00	2.05
Cut Nails, f.o.b. Pittsburgh	2.15	2.15	2.15	2.05
METALS:				
Copper, New York	14.75	14.75	14.75	12.37½
Spelter, St. Louis	5.50	5.45	5.50	4.50
Lead, New York	4.37½	4.37½	4.37½	4.10
Lead, St. Louis	*4.15*	4.15	4.25	4.00
Tin, New York	*28.45*	29.45	30.05	29.87½
Antimony, Hallett, New York	7.00	7.00	7.00	8.00
Nickel, New York	40.00	40.00	40.00	50.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.99	3.99	3.99	4.19

Chicago.

FISHER BUILDING, May 27, 1903.—(*By Telegraph.*)

There being fewer resales of Pig Iron and less Iron offered by independent merchant furnaces, a little more confident tone has been reflected in the market. The heavy purchase of Bessemer Iron by the United States Steel Corporation, too, has tended to steady the market for Low Phosphorus Iron, with which Foundry grades have sympathized. Otherwise the general situation has not changed essentially, the disturbed labor conditions being still a potent factor, delaying the placing of contracts in many lines. A further material drop in prices of Scrap Iron and Steel has called attention to that phase of the market, the decline being hastened by the policy of the Bar mills in holding off from purchasing supplies of any moment. The car manufacturers and railroads have bought a little more freely of Bar Iron, but the market as a whole has continued quiet. Most lines of Steel have continued quiet, but there has been no tendency toward lower prices of the manufactured product, the scarcity of intermediate products holding the market firm. There has been a moderate tonnage of Steel Bars, Plates, Rails and Structural Material placed during the week, but the large contracts for railroad bridges have been postponed until July. Sheets and Cast Pipe have continued very quiet, but Merchant Pipe and Boiler Tubes have continued surprisingly active. Merchant Steel has been without animation, but otherwise without change. The active demand for Billets has been one of the most interesting features of the week. moderate sales of domestic and resales of foreign having been made at little higher prices than prevailed a week or ten days ago.

Pig Iron.—In so far as the market has been relieved of the pressure from resale Iron there has been an improvement

in tone. A few independent merchant furnaces have continued to take business on a much lower level than is demanded by the Southern Association members, but the tendency has been toward a more settled market, although there has been much irregularity in prices. Most of the associated Southern furnaces are still far behind in deliveries on old contracts and are therefore making little effort to secure new business for prompt delivery, and consumers show little disposition to commit themselves for the last half of the year at current prices, although there have been more inquiries during the current week for the third and fourth quarters of the year than for some time past. In so far as prominent labor leaders have recognized the serious situation of labor unions the outlook has cleared, but the improvement has not been of a tangible sort. Confidence is still lacking, and till this element is fully restored little increase in business can be expected. A majority of consumers are covered for several months, but a respectable minority are buying almost daily at current market prices. When business is entered into for the last half of the year in earnest there can be little doubt that the increased cost of production will enter largely into the establishing of the market price. The higher prices paid to labor, with less efficient service and the increased cost of Ore and fuel, have no doubt placed the average cost of production above the level of a year ago. Coke, however, has already declined materially and to some extent has relieved the pressure upon Ironmasters. While the melt of Iron is undoubtedly heavy, the temporary suspension of many industries recently has changed the situation somewhat; to what extent will probably be reflected in monthly returns within a few weeks. Statistically considered the situation is, of course, strong, but market values often have a faculty for disregarding statistical returns, temporarily at least. Hence the improved outlook is not so clear as might otherwise be expected. A few Northern makers have shown some anxiety for business recently and lower prices have resulted, but this desire seems to have been pretty well satisfied, imparting a little better feeling at the close. The purchase, too, of 100,000 tons of Bessemer Iron by the United States Steel Corporation for delivery during the third quarter of the year has improved the situation in Steel making Iron materially and has already resulted in better inquiry for both Bessemer and Basic in this market, resulting in larger sales than have taken place for many weeks; but the details are not disclosed thus far. It is understood, however, to have been about 50c. higher than paid by the largest interest in the market. Most of the Southern Foundry Iron sold during the week has been on the basis of $15.50 to $16, Birmingham, for No. 2. Lots ran from 100 to 200 tons, for delivery in June, July and August. There have been other sales, however, of both Nos. 1 and 2 Foundry and Nos. 1 and 2 Soft at 25c. to 30c. per ton more by outside furnaces, but all sales have been small. The largest transaction has been in low grades, about 1000 tons of Gray Forge and Mottled Iron having been sold together at $13.65 to $13.75, flat, Birmingham. Several hundred tons of Silvery Iron, 5 to 6 per cent. silicon, have been sold at $22.85 to $24.25. Resales of between 800 and 1000 tons of Nos. 2 and 3 Foundry are reported to have been made at about $15, Birmingham. At the close, however, there has been little, if any, of such Iron available. The following are the prices current, f.o.b. cars, Chicago, for deliveries at once and extending forward three to four months:

Lake Superior Charcoal	$24.00 to $25.00
Local Coke Foundry, No. 1	21.00 to 22.00
Local Coke Foundry, No. 2	20.00 to 21.00
Local Coke Foundry, No. 3	19.00 to 20.00
Local Scotch, No. 1	21.50 to 22.50
Ohio Strong Softeners, No. 1	22.50 to 23.50
Ohio Strong Softeners, No. 2	21.80 to 22.30
Southern Silvery, according to Silicon	21.85 to 23.85
Southern Coke, No. 1	20.35 to 20.85
Southern Coke, No. 2	19.85 to 20.35
Southern Coke, No. 3	19.35 to 19.85
Southern Coke, No. 1 Soft	20.10 to 20.60
Southern Coke, No. 2 Soft	19.60 to 20.10
Foundry Forge	18.85 to 19.35
Southern Gray Forge	18.35 to 18.85
Southern, Mottled	18.10 to 18.60
Southern Charcoal Softeners, according to Silicon	24.85 to 26.85
Alabama and Georgia Car Wheel	28.85 to 29.85
Malleable Bessemer	20.30 to 20.80
Standard Bessemer	20.50 to 21.00
Jackson County and Kentucky Silvery, 6 to 8 per cent. Silicon	27.30 to 28.30

Bars.—There has been some little increase in the demand for both Bar Iron and Soft Steel Bars. Carriage manufacturers, car builders and implement manufacturers being the prominent buyers, but the tonnage has not been large, being about only 2500 tons of Steel and 2000 tons of Iron, mostly for fall delivery, both selling on about the same basis, while larger transactions of Iron have been at 1.75c., base, Chicago. Small lots have sold up to 1.80c. The following are the prices current, f.o.b. cars, Chicago: Bar Iron, 1.75c. to 1.85c.; Soft Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.16½c. to 2.26½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. The merchant trade has shown little if any improvement, but prices have been well sustained as follows: Bar Iron, 2.15c.; Soft Steel Bars, 2c. to 2.25c.; Angles, 2.25c., and Hoops, 2.40c., base, from store.

Structural Material.—Contracts for 2000 tons of Steel for railroad work are reported to have been closed, but there has been but little disposition to place additional tonnage of any importance for buildings, and about 10,000 tons of Material for railroad bridges have been suspended for about 60 days. But while the market remains quiet, the tone has continued steady, as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. The demand from local stocks has been light, but prices have been sustained as follows: Beams and Channels, 2¼c. to 2½c.; Angles, 2.25c. to 2.50c.; Tees, 2.30c. to 2.55c., at local yards.

Plates.—Contracts for about 4000 tons of Plates have been closed during the week for early shipment, otherwise the new business offering is only in small lots, and specifications on old contracts are not plentiful. However, all the mills are well supplied with orders and the situation is without change, the following being the prices current, f.o.b. cars, Chicago, mill shipment: Tank Steel, ¼-inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c. There has been some little improvement in the demand from local stocks and the market has remained steady, as follows: Steel, ¼-inch and heavier, 2.15c. to 2.20c.; Tank Steel, 3-16-inch, 2.25c. to 2.30c.; No. 8, 2.30c. to 2.40c.; Flange Steel, 2.40c. to 2.50c., all f.o.b. warehouse, Chicago.

Sheets.—The demand has continued to fall off, but the market has remained steady and prices have not changed essentially. The following are the prices current for Black Sheets, carload lots, Chicago, mill shipment: No. 10, 2.12½c. to 2.16½c.; No. 12, 2.22½c. to 2.26½c.; No. 14, 2.32½c. to 2.36½c.; No. 16, 2.42½c. to 2.46½c.; Nos. 18 and 20, 2.56½c. to 2.60½c.; Nos. 22 and 24, 2.66½c. to 2.70½c.; No. 26, 2.76½c. to 2.80½c.; No. 27, 2.86½c. to 2.90½c.; No. 28, 2.96½c. to 3.00½c. Small lots sell at from 10c. to 20c. about mill prices. Galvanized Sheets have been slow and barely steady on the basis of 75 and 10 discount, Pittsburgh, and 75 and 5, Chicago. Moderate sales from local stocks have been made on a basis of 75 and 2½ discount.

Cast Pipe.—There has been a moderate demand for small amounts of small and medium sizes from merchants, water and gas companies, and some little demand from railroads, but municipal lettings are few and far between. One contract for about 1500 tons will be let at Grand Rapids, Mich., the middle of this week. Prices have not changed essentially, manufacturers selling at the following prices, f.o.b. cars, Chicago, the outside being for small lots: Four-inch, $33 to $34; 6-inch, $32 to $33; 8-inch, $31.50 to $32, and larger, $31 to $31.50, for Water, and $1 per ton higher for Gas Pipe.

Billets.—A good demand has been experienced for both domestic and foreign Billets, and with light offerings the tone of the market has been a little firmer, with sales recently of about 2000 tons of rerolling Bessemer Billets at between $32.50 and $33, delivered Chicago. A resale of about 6000 tons of German Steel is reported to have been made by a local interest in the Pittsburgh district at a shade under $30, Pittsburgh. There have been moderate sales of Open Hearth Forging Billets at prices within the range of quotations, which are $34 to $38, mill shipment, according to analysis, buyer and time of delivery.

Merchant Pipe.—The demand has continued surprisingly active, with some difficulty in making prompt shipments of assorted sizes, there being a scarcity of Skelp for the smaller sizes. A firm tone has continued to prevail, prices remaining unchanged, based on the following schedule of discounts, for carload lots, Chicago, base, random lengths, mill shipment:

	Steel Pipe.		Guaranteed Wrought Iron.	
	Black.	Galvd.	Black.	Galvd.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ to ⅜ inch	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	70.35	60.35
7 to 12 inches	67.35	57.35	64.35	54.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—The mills have continued to receive satisfactory tonnage, jobbers having placed additional stock with outsiders, and the tone of the market has become firm. The following official schedule of discounts, carload lots, Chicago prevails:

	Steel.	Iron.
1 to 1½ inches	43.35	38.35
1¾ to 2½ inches	55.85	35.85
2¾ to 5 inches	60.85	45.85
6 inches and larger	55.85	35.85

Less than carloads, 12½ per cent. advance.

Distributers have experienced a good order demand from consumers. Shipments from local stocks have been satisfactory and the market firm in tone. The following are the discounts for shipment from local warehouse:

	Steel.	Iron.
1 to 1½ inches	40	35
1¾ to 2½ inches	50	32½
2¾ to 5 inches	57½	42½
6 inches and larger	50	..

Merchant Steel.—Agricultural Implement manufacturers have come in to place small orders for the 1903-04 season, but carriage and wagon manufacturers have been small buyers. The demand for Tool Steel, too, has fallen off somewhat and orders for Shafting have been less frequent. But the market has remained steady, the following being the prices current at Chicago for mill shipment: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

Rails and Track Supplies.—Several small lots of Standard Rails aggregating about 3000 tons have been closed by Eastern mills for early delivery during the week and there has been some further inquiry for Light Rails with sales of several thousand tons, but otherwise the prominent features of the market continue unchanged. About 2500 tons of relaying Rails are reported sold at $30, St. Joe, Mo. The market has continued strong and official quotations have remained unchanged at $28 for Standard and $27 for second quality, mill shipment, Light Rails ranging from $35 to $40, according to weight. Track Supplies have commenced to sell well and the market has remained firm for all kinds. The following are the prices current at Chicago for mill shipment: Splice or Angle Bars, 2c. to 2.25c.; Spikes, 2.10c. to 2.25c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 3c.; with Hexagon Nuts, 3c. to 3.25c. From store, 10c. to 15c. over mill prices are asked and obtained.

Old Material.—While the offerings of Scrap Iron and Steel have not been large, they have been more than the market was able to absorb readily, as the Bar mills are still holding off and dealers have been able to purchase at even lower prices, a decline of 50c. to $1 a ton having been sustained by most kinds during the week. A number of sales of from 100 to 250 ton lots have been made on the basis of quotations. The following are the prices current per gross ton, Chicago:

Old Iron Rails	$23.00 to $23.50
Old Steel Rails, mixed lengths	17.00 to 17.50
Old Steel Rails, long lengths	22.00 to 22.50
Heavy Relaying Rails	31.00 to 31.50
Old Car Wheels	22.00 to 22.50
Heavy Melting Steel Scrap	16.50 to 17.00
Mixed Steel	14.50 to 15.00

The following quotations are per net ton:

Iron Fish Plates	$18.50 to $19.00
Iron Car Axles	23.00 to 23.50
Steel Car Axles	23.00 to 23.50
No. 1 Railroad Wrought	18.00 to 18.50
No. 2 Railroad Wrought	16.50 to 17.00
Shafting	18.00 to 19.00
No. 1 Dealers' Forge	15.00 to 15.50
No. 1 Busheling and Wrought Pipe	13.50 to 14.00
Iron Axle Turnings	13.00 to 13.50
Soft Steel Axle Turnings	13.00 to 13.50
Machine Shop Turnings	12.75 to 13.00
Cast Borings	8.50 to 9.00
Mixed Borings, &c	10.00 to 10.50
No. 1 Boilers, cut	13.50 to 14.00
Heavy Cast Scrap	16.00 to 16.50
Stove Plate and Light Cast Scrap	12.00 to 12.25
Railroad Malleable	15.00 to 16.00
Agricultural Malleable	14.00 to 14.50

Metals.—There has been some little improvement in the demand for Copper, but with freer offerings the market has been a little easier in tone. Casting Copper has been sold at 14½c. and Lake is held at 15c. in carload lots, Chicago. Pig Lead is difficult to obtain in this market and prices are nominal on the basis of 4.30c. in 50 to 100 ton lots and 4.32½c. in carload lots, Chicago. Spelter has continued strong and active and prices have further advanced to 5.45c. to 5.50c. in carload lots for Slabs, while Sheet Zinc is scarce and prices have jumped to 8c., Chicago, in a jobbing way. Old Metals have been in only moderate demand and with freer offerings the market has been weaker for both Copper and Brass, but Zinc and Lead have remained strong. Heavy Cut Copper is offered at 12¼c., Red Brass at 12c., Copper Bottoms at 10¾c., Lead Pipe at 4c. and Zinc at 4.25c., spot.

Coke.—The offerings have continued liberal and, although there has been a fair demand, an easy tone has prevailed. Furnace Coke has been offered at $3 to $3.50 and Standard Foundry Coke at $3.50 to $4, at the ovens, freight to Chicago being $2.65, sales of round lots having been made on this basis. Single cars of Foundry Coke have sold at $5.90 to $6.65, spot, track.

Joseph T. Ryerson & Son, Incorporated, Chicago, announce the change of their Eastern office from 22 and 24 to 17 State street, Chesebrough Building, New York City.

The Field-Evans Iron Company announce the establishment of an office at Detroit, Mich., in the Hamond Building, in charge of R. S. Fox. The Pittsburgh district trade of the company will be looked after by Henry C. Newburg, who has recently made connections with the company, with headquarters in the M. and N. Bank Building, Columbus, Ohio.

The Buda Foundry & Mfg. Company have moved from 917 to 427 Monadnock Block, Chicago.

F. M. Pease, formerly with the Pease Car & Locomotive Works, has opened offices at 1654-1656 Monadnock Block under the firm name of Pease, West & Lillis to deal in second-hand cars, locomotives, rails and other railway equipment.

Julian L. Yale & Co., Chicago, formerly occupying offices in the Rookery, have removed to 303 Monadnock Block.

Philadelphia.

FORREST BUILDING, May 26, 1903.

The past week has not developed any material change in the Iron and Steel situation, although it may be remarked that the undertone is not hopeful. Business has shriveled to exceedingly small proportions, and it is almost impossible to interest large buyers in renewal contracts. Large concerns seem to have plenty of material to be delivered to them, and until they get closer to the end they are disposed to wait developments. Of course this works both ways, as heavy deliveries will be required until these contracts are completed, so that for the present producers will not be burdened with heavy stocks. The tide has turned, however, and shipments can be made as promptly as required, and this fact is doing much to keep buyers out of the market. When there is scarcity, or fears of scarcity, two or three times as much is taken as is likely to be required, and, conversely, when prospects indicate full supplies, and there is little doubt that buyers feel that way to-day, the more they are urged to buy the more convinced they are that prices are going lower. It may be too much to say that there is no falling off in consumption, but there is certainly no such decrease as there is in the demand; but the increase in capacity has changed the tone of the market. Coal, Coke, transportation and other essentials can be had to the fullest extent required, so that a domestic supply of more than 10,000,000 tons for the last half of the year can be easily produced, and probably will be produced, whether it is required or not. This, with the approach of midsummer, the unsatisfactory attitude of labor and the unsettled financial conditions, favors inactivity, which may continue until something definite is known in regard to crops, besides a settlement of the other matters to which we have called attention.

Pig Iron.—There is not enough business to make a market or to fix anything like exact quotations. Nominally prices stand about as they were a week ago, but the amount taken has been exceedingly small. For the present both sides are in an attitude of "waiting for something to turn up," but the underlying facts are not suggestive of improvement. Favoring conditions from a seller's standpoint are: 1, a considerable tonnage sold for forward delivery; 2, stocks on furnace banks very light, and 3, margin enough to stand a further reduction in prices if it becomes necessary. The buyers' standpoint is being unwilling to place new orders for the following reasons: 1, a good deal of Iron to come in on old contracts; 2, prospects for continued activity somewhat uncertain; 3, the larger offerings of Pig Iron and the greater urgency to secure business suggest a weak market, with the probability of a return to a level of prices more in accordance with normal conditions than those of the past 12 months. Buyers and sellers have therefore both got fairly good reasons for their beliefs, so that the outcome is not only uncertain as to result, but may also be uncertain as to time and extent. Be that as it may, buyers are not disposed to make new engagements under present conditions. There is no difficulty in getting No. 2 X Iron at $20, delivered, and for liberal quantities, deliverable during the last half of the year, better could be done; but in the absence of demand it would be a mere guess to say what price would be accepted. Meanwhile we continue last week's quotations (which, however, are almost nominal)—viz., for deliveries in buyers' yards—but only small lots have been taken at the figures named:

No. 1 X Foundry	$21.00 to $21.50
No. 2 X Foundry	19.50 to 20.50
No. 2 Plain	19.00 to 19.25
Gray Forge	18.50 to 19.50
Basic	19.00 to 19.25
Middlesbrough, No. 3	19.00 to 19.50

Cargo lots c.i.f.:

Low Phosphorus, 0.035	$20.85 to $21.00
Middlesbrough, No. 3	16.75 to 17.25

Steel.—There is very little demand for Steel, but prices are surprisingly firm considering the attitude of buyers. Makers ask about $31, delivered, for Bessemer Open Hearth, although on bids for 1000-ton lots and upwards something better could probably be done, but buyers take only such small lots as may be required for immediate use.

Plates.—The demand is not quite what could be desired, although a heavy tonnage is being delivered on former orders. New business is in fair volume, but not enough to

offset daily shipments. There is a fair probability of full employment for some little time ahead, and when the labor difficulties are settled it is rather expected that there will be renewed activity. Prices are steady and are as follows for city or nearby deliveries: Small lots, 1.95c. to 2c.; carload lots, ¼-inch and thicker, 1.75c. to 1.80c.; Universals, 1.80c.; Flange, 2c.; Marine, 2.10c. to 2.15c.; Fire Box, 2.20c. to 2.25c.

Structural Material.—Strikes in the building trades in various centers are causing a considerable easing up at mills, so that for the present there is no difficulty in getting prompt deliveries of almost anything that may be required. Prospects for the near future depend a good deal on the labor question, but if that was out of the way the mills would probably have all they could do to keep up with the demand. Prices are unchanged as follows: Beams, Angles or Channels, ordinary sizes, 1.73½c. to 1.80c. for carload lots, with the usual addition for smaller quantities.

Bars.—There is a good deal of weakness in Bars and orders are said to have been taken at very low figures by mills that semed likely to be short of orders in the near future, unless they secured something new. The tone of the market is exceedingly disappointing, and although lower costs for fuel and other material have been secured, it is hoped that the demand will be sufficient to prevent further reductions. Prices for carload lots are usually quoted at from 1.85c. to 1.87c. for Refined Iron and 1.70c. to 1.75c. for Steel Bars, city or nearby points.

Sheets.—There is a good demand, and full time is being made to meet daily requirements. Prices are unchanged and fairly steady at about 3c. for No. 28 in large lots.

Old Material.—There has been very little business of late and prices are decidedly weak, and few buyers even at the reduced quotations, which are as follows for deliveries in buyers' yards:

Old Steel Rails	$21.00 to $21.50
Heavy Steel Scrap	20.50 to 21.00
Low Phosphorus Scrap	28.00 to 29.00
Old Steel Axles	26.00 to 27.00
Old Iron Rails	24.50 to 25.00
Old Iron Axles	29.00 to 30.00
Old Car Wheels	22.50 to 23.50
Choice Scrap, R. R. No. 1 Wrought	22.00 to 23.00
Country Scrap	19.00 to 19.50
Machinery Scrap	18.50 to 19.50
No. 2 Light Scrap	18.00 to 19.00
No. 2 Light (Ordinary)	14.00 to 15.00
Wrought Turnings	15.50 to 16.00
Wrought Turnings, Choice Heavy	17.00 to 17.50
Cast Borings	11.00 to 11.50
Stove Plate	15.00 to 15.50

Cleveland.

CLEVELAND, OHIO, May 26, 1903.

Iron Ore.—The market has been slow. Sales have been made with hesitation, as if some of the smaller consumers were uncertain as to the amount they are to need and were not in a rush to cover for the season, having considerable material on the stock piles. In this way the market has been really unchanged, prices holding as they have been, at $4.50 for Bessemer Old Range and $4 for Bessema Mesaba. The lake movement has also been slow. The car shortage at the lower lake ports, while affecting no other business, has prevented the same movement over the docks this year as last, and the boats engaging in the trade have been delayed. The excess of vessel capacity is so clearly shown that the stability of rates is maintained through sufferance rather than the usual operation of the law of supply and demand. The shippers have not stopped taking boats, but give cargoes to all when possible, with the result that the delays to the vessels at the unloading ports have been generally prolonged. The rates of carriage have remained stable on both wild and contract cargoes, at 85c. from Duluth, 75c. from Marquette and 65c. from Escanaba.

Pig Iron.—The market this week developed the long expected transaction between the United States Steel Corporation and the Bessemer Pig Iron Association. This has been in the air for months. The fact that the corporation have bought a great block of Pig Iron at a good price for third quarter delivery has been understood by the other consumers as an indication that the corporation are satisfied with the figures, and the trade has strengthened generally. The question is raised whether the purchase was made at this time to strengthen the market. Such an impression is abroad. Other inquiries have been quite heavy and the trade is firm. The sales of Bessemer have made the Basic market lively and steady. Some of the furnaces are so well supplied with orders that they are not able to take any extensive part in this revival of business, but on the whole the market is active. More inquiries have been made during the week for second half delivery than for months previously. It is now beginning to look as if the price for second half delivery would be about on a par with the Bessemer quotation—namely, between $18 and $19, Valley furnace. In the absence of any transactions for the first half even the nominal quotations are discontinued, although it is hardly believed that they would be generally affected by the reduction of the second half material, the present demand for spot being too strong. The Foundry Iron market is beginning to show the effects of the change in the Bessemer situation, as inquiries are coming in steadily and the buying season for second half is but a short distance away. The possibilities are that the prices will be materially lowered as the trend of discussion is in that direction, present probable quotations being $18 to $18.50 for No. 2 Valley furnace. Very little is being done for spot shipment. Production is heavy and the shipments are unimpeded, the car supply being adequate for all needs.

Finished Iron and Steel.—The whole state of the market for the first part of last week was more or less bearish, but toward the latter part of the week there was a revival, especially Saturday and Monday, when the reports were abroad of the Pig Iron purchase by the United States Steel Corporation. In Plates the weakness developed to a considerable extent. It is now possible for some of the larger mills to make deliveries within 30 days, and this is cutting the smaller mills out of an increasing percentage of their business. The premiums on spot material are therefore disappearing, although some little business is being done at 2c., Cleveland. The Sheet situation has continued to be the strong feature of the market. Sales have been quite heavy, but with an advance out of the question in the present state of the general market. The transactions in this territory have been principally out of stock. Prices are based on 3.10c. to 3.25c. for No. 27 Black Sheets out of stock and 2.85c. to 2.95c. at the mills. In Structural Shapes the market is easing considerably. The labor difficulties and high prices obtained by workmen have been retarding features in a business which, at the beginning of spring, seemed to be in the best possible condition. Deliveries on new orders vary from two to three weeks on some sizes to between four and five months on the larger Angles. These deliveries have made it impossible for the smaller mills to get any business on a premium basis. The activity this week has been mostly in specifications against old contracts, although on Saturday and Monday some inquiries were received for new business, which has not yet been closed. The jobbers are selling a little material now and then at 2.15c. to 2.25c. out of stock. The Bar trade has not livened any. The bigger consumers have not purchased their material for the year following July 1, although most of the smaller concerns have already covered all of their needs. There has been some further talk of a lowering price on Bar Iron, but the mills have combated this tendency most vigorously. The price-list has not changed, continuing at 1.60c., Pittsburgh, for Bessemer Bar Steel; 1.70c., Pittsburgh, for Open Hearth Bar Steel, and 1.80c. to 1.85c., Youngstown, for Bar Iron. The call for Rails has eased up largely, because the mills are overstocked with orders and no more can be cared for. The price of Standard Rails is $28, Pittsburgh, and for Light Rails, $36, Pittsburgh.

Old Material.—The market has been dead. Prices have all inclined downward, but while sagging have not changed, principally through the lack of business. We continue to quote: No. 1 Wrought, $19.50, net; Cast Borings, $12, gross; Car Wheels, $22.50, gross; Heavy Steel, $21, gross; Iron Rails, $25.50, gross; Iron Axles, $27.50, net; Wrought Turnings, $14.50, net; Old Steel Rails, $21, gross.

Pittsburgh.

PARK BUILDING, May 27, 1903.—(*By Telegraph.*)

Pig Iron.—Actual purchases of Bessemer Pig Iron by the United States Steel Corporation for delivery in third quarter, and bought from the Bessemer Furnace Association and W. P. Snyder & Co., amount to about 50,000 tons. All this Iron is for delivery in July, August and September, and the price was $18.50, at furnace, equal to $19.35, Pittsburgh. In addition the Steel Corporation have bought 10,000 to 15,000 tons of Bessemer Iron for May and June shipment, for part of which $19, at furnace, was paid. The total purchases are about 100,000 tons, but this will probably be increased, as the Steel Corporation may buy some Iron from furnaces in the Valleys not affiliated with the Bessemer Furnace Association. The purchase of this large tonnage of Iron by the Steel Corporation is certain to have a beneficial effect on the market, as it will do much toward establishing the price of Iron for the third quarter at least. Last year the Frick Coke Company made contracts with a number of the Valley furnaces to give them all the Coke not needed by constituent interests in the Steel Corporation at $3 a ton at oven. These contracts run all through this year, and are, therefore, still in force. The Frick Coke Company will continue to furnish such Coke as they can spare to the Valley furnaces, from which the Steel Corporation have bought Iron at $3 a ton. The price of Bessemer Iron in small lots ranging from 1000 to 5000 tons remains at $19 to $19.25, and $19.35 at Valley furnace. Sales of probably 5000 tons or more have been made this week for prompt delivery at $19 to $19.35, at furnace. In Gray Forge and Foundry Iron buyers continue to hold off, and there is very little doing. Northern No. 2 Foundry Iron is offered at $20.50, at furnace, equal to $21.25, Pittsburgh, for July, August and September shipment. Southern No. 2 Foundry is offered at slightly lower prices. Northern Gray Forge is held at $19.75 to $20,

Pittsburgh, but Southern Forge is offered at $19.50 or less.

Steel.—There is a fair amount of inquiry for Steel in small lots, but the large consumers are covered by special contracts, prices being based on Pig Iron. The recent lowering of the price of Bessemer Iron will slightly reduce prices of Steel in these sliding scale contracts. Bessemer Billets for reasonably prompt shipment are held at $29.50 to $30, maker's mill, and Open Hearth about $30.50, maker's mill.

Rails.—Most of the new tonnage being placed for Rails is coming in from suburban traction lines, and this is the principal reason why the Carnegie Steel Company have decided to turn the Ohio Works at Youngstown on Rails again on Sunday night, May 31. The Carnegie Steel Company have some orders for Rails from traction companies which they must get out, as they are being pressed for delivery.

(By Mail.)

After several weeks of negotiations a deal was concluded in Pittsburgh on Monday afternoon, May 25, by which the United States Steel Corporation have bought from 125,000 to 150,000 tons of standard Bessemer Iron, all for delivery in July, August and September, at $18.50, Valley furnace, which with an 85c. freight rate makes the price $19.35 f.o.b. Pittsburgh. Negotiations are pending for the purchase of additional lots of Bessemer Iron from furnaces affiliated with the Bessemer Furnace Association, and should these negotiations go through, it is possible that the entire purchases of the Steel Corporation may aggregate 200,000 tons. The purchase of this immense tonnage practically takes up all the surplus Iron in the Mahoning and Shenango valleys and will do much to settle the price of Bessemer Iron for balance of this year, and is certain to have a very beneficial effect on the whole Iron market. The price is regarded as conservative both to buyer and seller, especially in view of the fact that deliveries are all for third quarter. Other large Steel interests who are heavy consumers of Bessemer Iron and who have been negotiating for purchases of round lots for some time will now probably come in the market and place contracts. The sale of this Iron will do much to quiet the pessimistic reports in relation to condition of the Iron trade and which have done much to unsettle the whole market. It is a fact that the Carnegie Steel Company and other concerns have been short of metal at their different works right along and have been using their utmost endeavors to induce furnaces to anticipate shipments as much as possible. It is also certain that the Steel Corporation will come in the market later and buy a round block of Iron for delivery in last quarter. Practically no foreign Pig Iron is coming into the Pittsburgh market owing to the fact that Southern furnaces are making such low prices on Foundry and Forge Iron. The situation in Steel continues strong and Bessemer Billets for early shipment bring $30 to $30.50, Pittsburgh. It should be noted, however, that all the large users of Steel are covered by sliding scale contracts for long periods of time, these being based on the monthly average prices of Bessemer Pig Iron, f.o.b. Pittsburgh. Under the terms of these contracts these large consumers get their Steel at prices somewhat under the open market charged for small lots of Billets. In Finished Iron and Steel the market does not show much change, demand for material being fairly active and prices firm. We note that some heavy inquiries are in the market for Sheared Steel Skelp.

Plates.—About two weeks ago there was a lull in demand and it looked for a time as though tonnage in Plates was going to fall considerably. However, in the past week a good many orders have been placed and demand is again almost as heavy as it was in the early part of the year. The Plate mills are all comparatively filled, some of them having enough tonnage to take their output for three or four months at least. Premiums for prompt deliveries have about entirely disappeared, practically all the tonnage placed being at official prices, which are as follows: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Muck Bar.—The market remains very quiet and prices are weak. We quote best grades of Muck Bar at $34.50 to $35, f.o.b. Pittsburgh. We have not been advised of any sales in this market for some time.

Steel Rails.—The Ohio works of the Carnegie Steel Company, at Youngstown, Ohio, which have been on Billets and Bars, will go on Rails again Sunday night, May 31. Only small lots are being placed, and it is said some of the railroads have postponed some contemplated extensive improvements owing to threatening attitude of labor and high prices of supplies. We quote at $28 at mill for Standard Sections.

Rods.—There is a moderate demand for Rods and prices are firm. We continue to quote Bessemer Rods at $37 and Open Hearth about $38, f.o.b. Pittsburgh.

Iron and Steel Bars.—The agreement among the Eastern Bar Iron mills has gone to pieces, and as a result prices on Iron Bars are somewhat lower, some of the Eastern mills offering quite freely in this market. Tonnage in both Iron and Steel Bars is disappointing, and none of the mills are as full of work as they would like to be. We quote Iron Bars at 1.80c. to 1.85c., f.o.b. Pittsburgh, and it is possible the lower price would be shaded on a very desirable order. Prices on Steel Bars are rigidly held by the mills, but on one or two occasions a few lots have been offered for resale at prices slightly under those quoted by the mills. We quote Steel Bars at 1.60c., at mill. All specifications for less than 2000 lbs. of a size subject to the following differential extras: Quantities less than 2000 lbs., but not less than 1000 lbs., 0.10c. per lb. extra. Quantities less than 1000 lbs., 0.30c. per lb. extra, the total weight of a size to determine the extra regardless of length.

Hoops and Bands.—There is a moderate demand for Hoops and Bands, but nothing is doing in Cotton Ties. We quote Cotton Ties, 88c. in 5000-bundle lots and over, and 91c. for less quantities. Steel Hoops are 1.90c. on 250-ton lots and over, and 2c. in less quantities. Bessemer Bands are 1.60c. up to No. 12 gauge, and Open Hearth, 1.70c., extras as per Steel card. These prices are f.o.b. maker's mill.

Structural Material.—No large lots have been placed in this district in the past week. There is no doubt that the threatening attitude of labor has caused a great many jobs to be postponed that otherwise would have been put through this year. Among these is large addition to the Hotel Schenley and three or four large apartment houses. Capitalists continue to await developments and are very cautious about investing money in new building enterprises. There is no change in prices, which are as follows: Beams and Channels up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c. to 1.70c.

Sheets.—Only a fair amount of new tonnage is being placed, the large contracts having been given out earlier in the year. Some of the Sheet mills, notably those of the leading interest, are quite full of work, while others could take care of a good deal more business if they had it. Prices on Sheets are firm, but unchanged, and we quote Black Sheets as follows: Nos. 22 and 24, Box Annealed, one pass through cold rolls, 2.45c.; No. 26, 2.55c.; No. 27, 2.65c. to 2.75c., and No. 28, 2.75c. to 2.85c. We quote Galvanized Sheets at 75 and 10 off in carload and larger lots for desirable orders, but note that some mills are quoting at 75 and 7½ off. In small lots Galvanized Sheets are held at 75 and 5 off.

Spelter.—For prompt delivery Spelter is somewhat scarce and prices are firm. We quote prime Western grades at 5.53½c. for futures and 5.58½c. for spot, f.o.b. Pittsburgh.

Pipes and Tubes.—It is not believed that the failure of the Eastern Tube Company will have any disquieting effect on the market. The Pipe trade remains in very satisfactory condition, tonnage being large, and prices are firmly held. Certain sizes of Pipe are hard to obtain for prompt delivery. Discounts to consumers in carloads are as follows:

Merchant Pipe.

	Steel.		Wrought Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inches	75	65	72	62
7 to 12 inches	69	59	66	56
Plugged and Reamed:				
1 to 4 inches	73	63	70	60
Cut 3 to 6 feet:				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inches	71	60	68	57
7 to 12 inches	65	53	61	50
Cut 6 feet and longer:				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inches	72	61	69	58
7 to 12 inches	66	54	62	51
Extra Strong Plain End:				
⅛ to 8 inches	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End:				
½ to 8 inches	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ per cent. advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 per cent. net for 6 feet and longer, and 15 per cent. net for 3 to 6 feet. We may note, however, that on Iron Pipe some of the outside mills are naming slightly lower discounts.

Merchant Steel.—A few belated contracts from Agricultural Implement makers are coming in the market, but as a whole tonnage is disappointing. Shafting continues quiet, and demand for Tool Steel is only fair. We quote: Tire Steel, 1.80c. to 1.90c.; Open Hearth Steel, ordinary

grades, 1.70c. to 1.80c.; Open Hearth Spring, 2.25c. to 2.35c.; Cant Hook Steel, 2.75c. to 3c.; Plow Slabs, Bessemer, 2.50c.; Plow Slabs, Open Hearth, 2.75c. to 2.85c.; Tool Steel, ordinary grades, 6½c. and upward; Cold Rolled Shafting, 42 per cent. off in less than carloads, and 47 per cent. in carloads, delivered in base territory.

Iron and Steel Skelp.—We note that inquiries are in the market for 6000 to 8000 tons of Sheared Steel Skelp. The market is firm, Grooved Iron and Steel Skelp being held at about 2c., and Sheared at 2.10c., f.o.b. Pittsburgh. It is possible that on very desirable orders these prices would be slightly shaded.

Coke.—The Coke trade remains in the same condition as noted last week. There is a surplus of Coke, and for prompt delivery Furnace Coke has been offered as low as $3 a ton. Output in the Upper and Lower Connellsville regions last week was slightly under 300,000 tons. Some contracts for 72-hour Connellsville Foundry Coke have been made for shipment over last six months at $4 a ton at oven. No contracts are being made for Furnace Coke for shipment over last half, but indications are that the price will range from $3 to $3.50 a ton at oven.

St. Louis.

CHEMICAL BUILDING, May 27, 1903.—(*By Telegraph.*)

Pig Iron.—Some few stray lots of Pig Iron are about all in the line of sales that can be reported the past week. The continued labor agitation, which is especially bad in points tributary to this market, is no doubt having its effect, but comparatively few are asking for shipments to be delayed on account of the labor situation, which fact is considered a very favorable one. Prices continue to show considerable variation, and while no lower points have been touched the past week we hear of sales on a basis of $15.50, Birmingham, for No. 2 Foundry. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry	$19.75 to $21.75
Southern, No. 2 Foundry	19.25 to 21.25
Southern, No. 3 Foundry	18.75 to 20.25
Southern, No. 4 Foundry	18.00 to 20.25
No. 1 Soft	19.75 to 21.75
No. 2 Soft	19.00 to 21.25
Gray Forge	17.75 to 19.75
Southern Car Wheel	25.50 to 26.00
Malleable Bessemer	22.00 to 22.50
Ohio Silvery, 8 per cent. Silicon	29.00 to 30.00
Ohio Strong Softeners, No. 1	23.00 to 23.25
Ohio Strong Softeners, No. 2	22.50 to 22.75

Bars.—The Bar market has shown a somewhat disturbed condition, Steel maintaining a fairly steady undertone, while Iron has shown some weakness. Jobbers continue to handle a fair volume of store trade. We quote from the mills: Iron Bars at 1.80c. to 1.90c. and Steel at 1.80c. to 1.90c., one-half extras. Jobbers' quotations show no change, being 2.15c. for round lots of both Iron and Steel, with 10c. advance in small quantities from store.

Rails and Track Supplies.—The general tone of this department of the market is very strong, with perhaps a trifle less of new business for the past week. While there has been no particular effect as yet, it is current in the trade the possibility of curtailment of purchases by the railroads if labor complications become general. We quote as follows: Splice Bars at 2.05c. to 2.25c.; Bolts, with Hexagon Nuts, 3.05c. Jobbers' prices are generally about 10c. to 15c. higher than the above quotations.

Angles and Channels.—Trade conditions warrant very favorable comment, as the demand upon the jobbers is said to be very well sustained. For material of this class 2.25c. to 2.40c. is the quotation from store.

Pig Lead.—The market for Pig Lead is very quiet, with quotations showing but slight variation since our last report. Few buyers are in the market, and while the market is not considered weak the tendency seems toward a lower basis. Missouri brands are salable at 4.15c.

Spelter.—Spelter for spot delivery is said to be readily salable at 5.50c., and considerable demand has shown at this figure. Future deliveries are quotable from 5.40c. to 5.45c.

Birmingham.

BIRMINGHAM, ALA., May 27, 1903.—(*By Telegraph.*)

A report of the Iron market is but the recapitulation of what has been reported for the last several weeks. There is no change. Some ask prices that pile up Iron in the yards, while others accept prices necessary to keep yards clean. The closest competitors of the latter are founders to whom belated deliveries were due and who were compelled to make other arrangements as to melting. The result is realization of profit without melting and crediting of sales to this district that are made by buyers in buying districts who are running from deliveries they have supplied from other sources. Those in an independent position maintain the association prices, in which they are encouraged by a rather free inquiry. Business is limited and quotations are so irregular that they cannot be considered as reliable. There are some large interests anticipating a largely increased buying in June and at the same time are fearful of demands that will increase the cost of making Iron for last half the year. This element will not make concessions. The situation is a muddled one, with both sides playing a waiting game. We are not running at maximum capacity and will not be for some time. As things are now developing it is simply a hit or a miss market, with not enough confidence on either side to give any decided tone to it. Those bare of Iron wanted say they would sell it on basis of $16 if they had it. Those who have it as a rule are declining to sell on that basis. Iron is cheaper in second hands than in first hands.

Cincinnati.

FIFTH AND MAIN STS., May 27, 1903.—(*By Telegraph.*)

All the signs in the Pig Iron market this week point to a speedy break in the deadlock which has existed for the past six months between buyers and sellers. The market has subsided to the basis of $15, Birmingham, for No. 2 Foundry, and on this basis sales of 2000 tons of this class of Iron were reported from this city. The Forge and kindred lines are still the weakest points in the quotation sheet and have gone down proportionately. The low figure of $13.25 has been reached, and at this price, Birmingham basis, a sale of 1000 tons is reported. The general market has been rather quiet and sales as a rule were confined to small lots, but the volume of inquiry has very materially increased. Quite a good deal of expectation is based upon the probable action of the Southern Association at their meeting of June 1. The general opinion is that after that date these furnaces will be authorized to meet the outside figures, as they now exist, and there seems to be but little question as to a large volume of business being immediately forthcoming on that basis. Northern Iron is a little bit lower, and but very little is selling in this district. What there is is going at about $19.50 to $20, Hanging Rock. Freight rates from the Hanging Rock district, $1.15, and from Birmingham to Ohio River points, $3.25. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

Southern Coke, No. 1	$18.75 to $20.25
Southern Coke, No. 2	18.25 to 19.75
Southern Coke, No. 3	17.75 to 19.25
Southern Coke, No. 4	17.00 to 18.00
Southern Coke, No. 1 Soft	18.75 to 20.25
Southern Coke, No. 2 Soft	18.25 to 19.75
Southern Coke, Gray Forge	16.50 to 17.50
Southern Coke, Mottled	16.50 to 17.50
Ohio Silvery, No. 1	25.15 to 26.15
Lake Superior Coke, No. 1	21.15 to 22.15
Lake Superior Coke, No. 2	20.15 to 21.15
Lake Superior Coke, No. 3	19.15 to 20.15

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	$28.25 to $29.25
Lake Superior Car Wheel and Malleable	27.50 to 28.50

Plates and Bars.—We quote, f.o.b. Cincinnati, as follows: Iron Bars in carload lots, 1.92c., with half extras; same, in small lots, 2.20c., with full extras; Steel Bars, carload lots, 1.73c., with half extras; same, in small lots, 2.20c., with full extras; Plates, ¼-inch, in carload lots, are still nominally 1.70c.; 3-16 inch, 1.80c.; Beams and Channels, 1.70c., base.

Old Material.—There is but very little change in the market, and prices are about stationary. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $17 per net ton; Iron Rails, $20.50 per gross ton; Long Steel Rails, $19 per gross ton; same, short, $17 per gross ton; Iron Axles, $23 per net ton; Car Wheels, $24 per gross ton; Low Phosphorus Steel, $24 per gross ton; Heavy Melting Steel, $19 per gross ton.

Unparalleled Furnace Records.—No. 1 stack of the Clairton Steel Company, at Clairton, Pa., whose achievements we have before referred to in these columns, continues to break all records for output of pig iron for an 85-foot stack. This furnace is running on practically all Mesaba ore and the output for any 24 hours has never been below 460 tons. On Friday, May 22, the stack turned out 530 tons, on the day following 540 tons and on Sunday, May 24, the product was 560 tons. These records for an 85-foot stack and for a furnace using all Mesaba ore have never before been equaled. Blast furnace managers all over the country are taking a great interest in the performance of this furnace, and it is not probable that in the future blast furnace stacks higher than 85 or 90 feet at the extreme will be built.

Catalogues Wanted.—The Todd-Walton Hardware Company, Iuka, Miss., would be pleased to receive from manufacturers catalogues of steam engines, boilers, saw mill machinery, planers, presses and gins, with trade discounts and discounts usually allowed consumers.

The New Tin Plate Scale.

After conferences held in the Battery Park Building, New York City, lasting more than a week, and which were concluded on Wednesday evening, May 20, an agreement was finally reached between officials of the American Tin Plate Company and the Amalgamted Association of Iron, Steel and Tin Workers by which a wage scale governing wages in tin plate mills owned by the American Tin Plate Company, and which sign the Amalgamated Association scale, was finally adopted. A number of important changes have been made in the new scale, which is effective for the year ending June 30, 1904. The memorandum of agreement and the base rates in the scale remain as heretofore, but the table of wages for shearing on jaw or crocodile shears and job or sheet work is entirely eliminated, as none of the tin plate mills that sign the Amalgamated scale are now equipped with squaring shears. In the foot notes of the scale no changes are made until No. 5 is reached, which has been changed to read as follows:

"5. That all sheets or tin plates 14¼ [formerly 14] square feet and over, when finished in six or more sheets to the pack, shall be paid for at the following rates above tin plate scale: Ten per cent. extra on 26 gauge and heavier, and 20 per cent. for all lighter gauges, up to and including 32 gauge, and for all sheets or tin plate 15½ square feet and over, finished in fours, the same percentage shall apply."

Foot note No. 6 has been changed to read as follows, the part in brackets having been eliminated:

"6. Where improved squaring shears are used the company shall pay for opening packs and grinding the knives [and on jaw or crocodile shears the company to pay for opening packs], and in mills where plates are cut into 14 x 20 inches or smaller sizes additional pay shall be arranged as follows: For four or five cuts, 10 cents per ton above scale price shall be paid, and 5 cents per ton additional for each extra cut thereafter."

No further changes are made until foot note No. 16 is reached, which in the new scale reads, the part in brackets having been eliminated, while the part in italics has been added:

"16. That all tin mills working iron or steel over 32 inches wide shall be classed as large mills, and 10 per cent. extra shall be paid for all such widths over 32 inches wide up to 35 inches wide; for 35 inches wide and over [containing less than 14 square feet], 20 per cent. extra shall be paid. *When percentages are paid under this clause those under No. 5 shall be inoperative.*"

Foot note No. 21 has been entirely stricken out of the new scale. It read as follows:

"21. That there shall not be any making up of lost weight on tin or black plate mills, on a turn where crews are obliged to follow out or give up the mill in less time than seven hours."

Foot note No. 22 has been changed to No. 21 and 23 has been changed to 22, but remain as in the old scale.

Foot note No. 24 is No. 23 in the new scale and has been changed to read as follows:

"23. When, in the judgment of the manager [and mill committee] the work is too heavy for catcher, that the company shall furnish help."

Foot note No. 25, which read "That the company shall move each turn as soon as finished, or make room for following catcher to pile his iron," has been entirely stricken out.

A new foot note, No. 24, has been adopted, which reads as follows: "That the company furnish ice or well water to their employees."

The Limit of Output.

The important changes made in the scale are in the limit of output, and this has been changed on all gauges running up to 36 and lighter, the output for each gauge having been materially increased. This was the principal contention in the scale, the American Tin Plate Company insisting that the men be allowed to make an increased output. In the new scale the limit of a turn's work remains at eight hours and the new output is given in the first column, while in the second column is given the output allowed under the terms of the old scale, the difference between the two tables showing the increased output allowed in the new scale:

OUTPUT.

The limit of a turn's work of eight hours shall be as follows:

On gauge.		100 pounds.
Nos. 8 to 11	14,000	13,500
" 12 to 13	13,000	12,500
" 14 to 15	12,000	11,500
" 16 to 17	11,000	10,500
" 18 to 20	10,000	9,500
" 21 to 24	8,000	7,500
No. 25	7,250	6,750
" 26	6,850	6,350
" 27	6,650	6,150
" 28	6,650	5,650
" 29	6,350	5,850
" 30	6,250	5,750
" 31	6,050	5,550
" 32	5,650	5,350
" 33	5,450	5,150
" 34	5,250	4,950
" 35	5,250	....
" 36 and lighter	4,950	....

1. On sizes 20½ x 56 an excess of 10 per cent. may be made, but on sizes less than 20 inches wide the per cent. cannot be made, and on 26 wide and over an excess of 15 per cent. on the limit may be made; but if not made on that turn the percentage cannot be made up.

Scale of Prices for Morewood Stacks.

	Tinning. Cents.	Washing. Cents.	Catching. Cents.
Coke	11	11	3¾
B. Charcoal	12	12	4
Charcoal	12	12	4
Double rolling	14	14	4
Heavy coating	12	12	4
Old style	15	15	4

Standard.—A box of 14 x 20 containing 112 sheets = 31,360 square inches to be the standard.

All boxes weighing over 136 pounds to be paid for as overweight.

The committee representing the American Tin Plate Company in the conference was composed of W. P. Beaver, chairman, and District Managers J. R. Phillips, Berthold Goldsmith, Cecil A. Robinson, George Greer and C. W. Bennett. The Amalgamated Association was represented by a committee consisting of Theodore Schaffer, chairman; John Williams, secretary, and a committee of six employees from different tin plate mills.

Chicago Labor Settlements.

(*By Telegraph.*)

CHICAGO, ILL., May 26, 1903.—A settlement of the labor difficulties of the Allis-Chalmers Company is announced by an agreement to advance wages of all trades engaged by the company 10 per cent. and the establishment of a nine-hour day throughout all the shops of the company. Fifteen hundred men are affected.

The Chicago Metal Trades Association have signed an agreement with the metal workers which gives to the employers the freedom of contract. The association agrees not to discriminate against union members, to establish a nine-hour day and to increase wages as follows: Ten per cent. for those getting 24 cents an hour and under, 5 per cent. for those getting over 24 cents but not more than 28 cents an hour and 2½ per cent. for all getting over 28 cents an hour. The agreement affects over 100 shops and between 1200 and 1500 men.

A Valuable By-Product.—A very large iron ore mining company are producing a by-product which should be valuable in other branches of industry. It is obtained incidentally in magnetic ore concentration, and contains from 18 to 22 per cent. of phosphoric acid and 15 per cent. of iron. The balance is silver and hornblende.

After a month's strike the boilermakers of the Phœnixville Iron Works, at Meadville, Pa., have resumed work. The plant is being operated full time.

New York.

NEW YORK, May 27, 1903.

Pig Iron.—The market is very dull. Founders are taking only small lots for immediate consumption and offer considerably below nominal prices. Transactions are on so small a scale that the true values are difficult to determine and quotations are nominal. Foreign Pig Iron is now practically out of the market. With Middlesbrough No. 3 offering in cargo lots at $17, ex-ship, cash against documents, the selling price to consumers must be at least $1 per ton higher to cover risks and profits, because very few founders can take as much as a cargo lot at a time. Then there are only very few consumers whose works are so located that direct delivery can be made. The result is that cost of delivery must be added, which brings the price to the consumer up to $19 to $19.50 for No. 3 Middlesbrough, which is after all not suitable for many purposes, with its high phosphorus and its tendency toward irregularity. We do not hear of any offerings of German Iron. We quote, for delivery at New York and tidewater, nominally: Northern No. 1, $20 to $21; No. 2 Foundry, $19.25 to $20; No. 2 Plain, $18.75 to $19.25. Tennessee and Alabama brands: No. 1, $20 to $20.50; No. 2, $19.50 to $20.25, and No. 3 Foundry, $19 to $19.25.

Steel Rails.—Current business is light and prices are unchanged. It is understood that the representatives of the Rail mills are to meet at an early date in order to discuss the question of prices for next year, the statement being made that there is considerable inquiry for delivery beyond the current year. During the present year there has been a good deal of demand for the third rail for electric lines. Specifications for these special Rails call for 60-foot lengths, for which the mills charge $1.50 extra, and for special chemical composition, for which $2 per ton extra is obtained.

Cast Iron Pipe.—No transactions of magnitude are reported, but business continues active in small lots and prices are unchanged. Manufacturers would like to see more orders for large sizes of Pipe, but their foundries are nevertheless well employed, with their capacity covered for several months. Carload lots are quoted at $36.50, gross ton, at tidewater, for 6 and 8 inch, and $35.50 for 12-inch and upward.

Finished Iron and Steel.—The American Bridge Company report that contracts for the buildings for the new works of the National Tube Company, at McKeesport, Pa., and Lorain, Ohio, were finally closed the past week, aggregating 30,000 tons. They also secured contracts for a building for the Federal Sugar Company, Yonkers, which will take about 4000 tons, and a building for the Van Norden Trust Company in this city, taking 2000 tons. They confidently expect a still larger tonnage to be booked before the expiration of this week, and believe that this will be the banner month in their history for business secured. The Plate trade is much more active, numerous orders having been placed since last report. Among the transactions which have been closed were 2700 tons for Riveted Pipe in this city, referred to as under negotiation last week, and 350 tons for the boilers to be used in the Fifty-ninth street station of the subway. Some orders called for very prompt delivery. Prices of Plates are well maintained in this market. The Bar Iron trade shows some recovery from its unsettled condition immediately after the withdrawal of a large mill from the Eastern Association. Manufacturers are displaying greater firmness, endeavoring to maintain prices on Refined Bar Iron at 1.70c. to 1.80c. at mill. They are reported to be in need of orders, however, and it would not be surprising to hear of the closing of some mills to await a revival of the demand. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates, in carload lots, are 1.85c. to 2c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.35c. upward for Fire Box. Refined Bars are 1.80c. to 2c.; Soft Steel Bars, 1.75c. to 1.90c.

Old Material.—Steel Scrap is in strong demand. Old Steel Rails for rerolling are particularly active. Old Iron Rails are so scarce that the price is maintained, notwithstanding the limited demand. Cast Scrap is weak, with consumers making offers under the views of holders. Practically no demand is experienced for rolling mill stock, and quotations on this class of material are nominal. We quote, f.o.b. cars vicinity New York, per gross ton, as follows:

Old Iron Rails	$23.50 to $24.00
Old Steel Rails, long lengths	22.00 to 22.25
Old Steel Rails, short pieces	19.25 to 19.50
Relaying Rails, heavy sections	27.00 to 28.00
Relaying Rails, lighter sections	29.00 to 30.00
Old Car Wheels	19.50 to 20.00
Old Iron Axles	28.50 to 29.50
Old Steel Car Axles	25.50 to 26.50
Heavy Melting Steel Scrap	19.25 to 19.50
No. 1 Railroad Wrought Scrap Iron	20.00 to 21.00
Iron Track Scrap	19.00 to 20.00
Wrought Pipe	15.00 to 16.00
Ordinary Light Iron	11.00 to 12.00
No. 1 Machinery Cast Scrap	17.00 to 17.50
Stove Plate	12.50 to 13.00
Cast Borings	9.50 to 10.00
Wrought Turnings	15.00 to 15.50

Metal Market.

NEW YORK, May 27, 1903.

Pig Tin.—Heavy declines on all sides marked the week under review. The markets here, in London and in the Straits declined heavily. The lowest point was reached yesterday, when spot sold here at 28.37½c. and London went as low as £128 15s. There was a slight rally to-day, however, and this market closed 28.45c. to 28.65c. for spot, May and June deliveries. The London market closed to-day £129 15s. for spot and £127 15s. for futures. The decline in price here amounts to just 1c. per lb. The London decline is somewhat wider, amounting to £4 5s. on spot and £5 5s. on futures. The price for futures just about corresponds with the Singapore quotation. It will be observed that the discount on futures has increased £1 over last week. Business has been extremely dull so far as orders for consumption are concerned. Shipments promised to again show heavily this month, indicating that consumers are still being well supplied with the metal purchased at lower prices.

Copper.—The market has been extremely dull. Although there were no changes in the "official" price here, the London market declined heavily. The price quoted by producers is still 14.75c. to 15c. for Lake and Electrolytic and 14.50c. to 14.75c. for Casting. Outside offerings of Lake and Electrolytic continue at 14.50c. to 14.75c., and as there was little demand for outside lots of Casting stock, quotations are to be had as low as 13.75c. In London spot fell to £61 7s. 6d. and futures declined to £60 2s. 6d. It will be noted that a discount of £1 5s. now exists on futures, and it might be mentioned that this is the largest prevailing at any time for a year or more. Best Selected declined 15 shillings to £66. Exports are very small thus far this month, aggregating but 8222 tons, as compared with 13,249 tons for the corresponding period of last year.

Pig Lead.—There is no change here, the American Smelting & Refining Company still quoting 4.37½c. for Desilverized in carload lots, f.o.b. New York. The London market is unchanged at £11 12s. 6d.

Spelter.—The market is quiet with but a small amount of business being transacted. The quotation here is unchanged at 5.75c., and St. Louis quotes 5.50c. London has declined 5 shillings, being quoted to-day £20 12s. 6d.

Antimony.—There has been a decline of ¼c. in Cookson's price, the figure now quoted being 7½c. Hallett's is still 7c., and other brands are unchanged at 6⅝c. The market is weak.

Nickel.—We continue to quote 40c. to 45c. for large quantities and 50c. to 60c. for small lots.

Quicksilver.—The market is $47.50 for flasks of 76½ lbs.

Tin Plate.—The situation contains nothing new. Production is being rushed in anticipation of the coming season. The official quotation continues at $3.80 for box of 14 x 20 100-lb. Cokes, f.o.b. mill, which is equivalent to $3.99, New York. The Swansea market declined 1½ pence to 11 shillings 9 pence.

Iron and Industrial Stocks.

The decline in the stock market, which has been in progress almost continuously since early in January, appears to have culminated in heavy liquidation on Monday of this week, when the lowest prices were touched on many stocks during this movement. A panic prevailed on the Montreal stock market on Thursday of last week, which forced the price of Dominion Steel common to 13 and the preferred to 40, while Dominion Coal sold down to 88. Both the New York and Montreal markets have recovered to some extent, and it is now believed in financial circles that the worst is over and that gradually improving prices may be expected. The depression in the stock market during the week was intensified by unfounded rumors regarding the iron trade, reports being current that United States Steel Corporation had closed some of their mills for lack of orders. These reports were officially denied, but in the meantime they had, of course, a decidedly unfavorable effect.

The low point touched on active stocks during the week was as follows: American Can common 5, preferred 43½; American Car & Foundry common 36, preferred 88¼; American Locomotive common 22¾, preferred 90; Steel Foundries common 11; Cambria Steel 22¾; Central Foundry common 3, preferred 14; Colorado Fuel 65¾; Crucible Steel common 16⅝, preferred 81; Otis Elevator common 38, preferred 95½; Pressed Steel common 55¼, preferred 89½; Railway Spring common 28¾, preferred 85½; Republic common 15, preferred 75; Sloss-Sheffield common 50; Tennessee Coal 54; United States Steel common 30½, preferred 80; Chicago Pneumatic Tool 47. Recovery from the low prices named has in some instances been quite sharp, but as a rule it has ranged from $1 to $2 per share. Transactions in the new 5 per cent. bonds of the United States Steel Corporation have been on a large scale, with the price well maintained in the face of the liquidation in the general stock list.

At a meeting of the stockholders of the Kelly & Jones Company of Pittsburgh, with works at Greensburg, Pa.,

held on Saturday, May 23, it was decided to issue $500,000 in 5 per cent. bonds on June 1. The additional capital is to be used in more than doubling the plant. The bonds will be floated by the Real Estate Trust Company of Pittsburgh.

The new stock of the Manufacturers' Light & Heat Company has been listed on the Pittsburgh stock exchange. The amount of capital paid in is $21,500,000, divided into 430,000 shares of the par value of $50 each. The company have a funded debt of $3,265,000 and a floating debt of $4,907,302, of which latter $3,750,000 was incurred in the purchase of the Ft. Pitt Gas stock. It is about to issue $6,500,000, all of which has been underwritten, for the purpose of extinguishing the floating debt and providing for a trunk line to West Virginia. The gross earnings of the company for the quarter ended March 31, 1903, were $1,354,589, and the net $979,357. It is stated that it will be the policy of the company to continue the payment of quarterly dividends, beginning with 1½ per cent.

A meeting of the stockholders of the Standard Steel Car Company will be held in the Frick Building, Pittsburgh, on Monday, June 29, for the purpose of voting for or against an increase in the capital stock of the company. At the same meeting a vote will be taken on the question of a proposed increase in the indebtedness of the company.

Dividends.—The directors of the National Fire Proofing Company of Pittsburgh have declared the regular quarterly dividend of 1½ per cent. on the preferred stock.

Republic Iron & Steel Company have declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable July 1.

National Lead Company have declared the usual quarterly dividend of 1¾ per cent. on the preferred stock, payable June 15.

American Shipbuilding Company have declared the regular quarterly dividend of 1 per cent. on the common stock, payable June 1. Books close May 23 and reopen June 2.

Railway Steel Spring Company have declared the usual quarterly dividend of 1¾ per cent. on the preferred stock, payable June 20. Books close June 10 and reopen June 22.

The Meeting of the Metal Trades Representatives at Cincinnati.

During the last three days of last week an important conference was held in Cincinnati between the officers of the National Metal Trades Association, their district chairmen and vice-chairmen and representatives of other local metal trades associations throughout the country. As previously announced in these columns, the object of this meeting was to bring the representatives of the locals in closer contact with the national body to demonstrate the efficient working of the Cincinnati Metal Trades Association. This was supplemented by addresses on topics of interest and the meeting was concluded by an excursion to nearby pleasure resorts and a banquet given in the new quarters of the Business Men's Club.

The first day's sesion was devoted to a general review of the working of the Cincinnati Association and remarks made by Commissioner E. F. DuBrul of the National Metal Trades Association defining the relationship between the locals and the National Association. Friday's session was given up to an investigation into the operation of the employment department of the Cincinnati Metal Trades Association. This was introduced by the presentation of an elaborate paper covering the subject by J. C. Hobart, who has been very prominent in bringing about the success of this department of the work in Cincinnati. This work was so interesting that arrangements were made by the representatives of the local metal trades associations who are not now affiliated with the National Metal Trades Association to inaugurate such departments in their cities and co-operate with the National Association. The representatives of the district committee of the National Metal Trades Association also took away with them the necessary data for the institution of employment bureaus in their respective localities, as such a movement was decided upon at the last convention of the national organization held in Buffalo.

The practical result of the Cincinnati conference will be a chain of employment departments located in the principal machinery producing centers of the country, which, through the national organization, will have means of intercommunication and co-operation. The conference was presided over by E. F. DuBrul. The meetings were held in the quarters of the Cincinnati Metal Trades Association. At the banquet at the Business Men's Club a number of the foremen of various Cincinnati plants were present and they made impromptu speeches, setting forth the attitude of some of the men in connection with certain phases of the labor situation brought out in the remarks of the speakers.

The following were present throughout the conference:

F. A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio, treasurer National Metal Trades Association.
E. F. DuBrul, commissioner National Metal Trades Association, Union Trust Building, Cincinnati, Ohio.
Robert Wuest, secretary National Metal Trades Association, Union Trust Building, Cincinnati, Ohio.
Phil. O. Geier, deputy commissioner National Metal Trades Association, Cincinnati, Ohio.
C. E. Hildreth, P. Blaisdell & Co., Worcester, Mass., chairman First District National Metal Trades Association.
F. D. Wanning, Birmingham Iron Foundry, Derby, Conn., vice-chairman First District National Metal Trades Association.
F. H. Stillman, Watson-Stillman Company, New York, chairman Second District National Metal Trades Association.
F. A. Sheffler, Marine Engine & Machine Company, Harrison, N. J., vice-chairman Second District National Metal Trades Association.
H. C. Hunter, secretary New York Metal Trades Association, New York.
P. B. Kendig, Seneca Falls Mfg. Company, Seneca Falls, N. Y., chairman Third District National Metal Trades Association.
W. Grant King, Iroquois Iron Works, Buffalo, N. Y., vice-chairman Third District National Metal Trades Association.
A. Falkenau, Falkenau-Sinclair Machine Company, Philadelphia, Pa., chairman Fourth District National Metal Trades Association.
P. A. Zimmer, secretary Pittsburgh Metal Trades Association, Pittsburgh.
Wm. Lodge, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, chairman Sixth District National Metal Trades Association.
H. M. Norris, Bickford Drill & Tool Company, Cincinnati, Ohio, vice-chairman Sixth District National Metal Trades Association.
S. P. Egan, J. A. Fay & Egan Company, Cincinnati, Ohio.
E. S. Hargrave, Cincinnati Tool Company, Cincinnati, Ohio.
P. G. March, Cincinnati Shaper Company, Cincinnati, Ohio.
D. B. Kirk, C. & G. Cooper Company, Mount Vernon, Ohio, Seventh District National Metal Trades Association.
W. D. Sayle, Cleveland Punch & Shear Works, Cleveland, Ohio, chairman Eighth District National Metal Trades Association.
E. C. Wells, Quincy Engine Works, Quincy, Ill., vice-chairman Tenth District National Metal Trades Association.
F. K. Copeland, Sullivan Machinery Company, Chicago, Ill., chairman Eleventh District National Metal Trades Association.
H. H. Latham, Latham Machinery Company, Chicago, Ill., Eleventh District National Metal Trades Association.
C. F. Wieland, Kempsmith Mfg. Company, Milwaukee, Wis., chairman Thirteenth District National Metal Trades Association.
O. B. Kinnard, Kinnard-Haines Company, Minneapolis, Minn., vice-chairman Fourteenth District National Metal Trades Association.
J. C. Hobart, care of Triumph Electric & Machine Company, Cincinnati, Ohio.
G. W. Watts, Canadian General Electric Company, Toronto, Ont., vice-chairman Seventeenth District National Metal Trades Association.
A. C. Fischer, secretary Cincinnati Metal Trades Association.
Thomas M. Roche, secretary Cleveland Metal Trades Association.
W. P. Egan, vice-chairman, F. W. Wolf Company, Chicago, Ill.
F. C. Wheaton, Fensom Electric Works, Toronto, Canada.
Julian V. Wright, vice-chairman, National Cash Register Company, Dayton, Ohio.
R. H. Jeffrey, Jeffrey Mfg. Company, Columbus, Ohio.
W. B. Cowles, vice-chairman, the "Long Arm" System Company, Cleveland, Ohio.
Harry Hoeffinghoff, president Bickford Drill & Tool Company, Cincinnati, Ohio.

Union Pacific Shop Strike Settled.

It is announced that after a year's strike at the shops of the Union Pacific Railroad and a sympathetic strike of long duration on the Southern Pacific and other Harriman lines, the contest has finally been settled upon the basis of the following telegram sent by E. H. Harriman to John McNeil, grand president and organizer of the Brotherhood of Boilermakers, the boilermakers having been at the bottom of the trouble:

Rather than permit a condition to be brought about whereby men's homes would be broken up and their families, wives and children be permitted to suffer through no fault of their own, I will recommend to Mr. Burt, president of the Union Pacific, and suggest to you for consideration the following:

The sympathetic boilermakers' strike on Southern Pacific and other lines to be called off; Union Pacific strike to be called off; matter of piece work to be left to the men themselves, both those already employed and to be employed hereafter by the Union Pacific, and piece work not to be further extended on the Union Pacific and to be abandoned at the end of four months, if so determined upon by a representative of the company and of the men; if they cannot agree, it to be referred to other representatives not directly engaged in managing the road or the strike; the piece work system not to be extended to the Southern Pacific or other lines, except after conference and agreement with the boilermakers; no discrimination to be made against former employees on the Union Pacific when places are to be filled and no discrimination to be made on account of their accepting temporarily the piece work or not, and any adjustment thereof to be determined between representatives as above provided. In lieu of this, call off the strike, both sympathetic and otherwise, as above, and refer the whole Union Pacific controversy in its present condition to arbitration to be agreed upon.

These terms, it is said, were accepted, and the men ordered to return to work.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 25, 1903.

Machine tool interests of this vicinity are experiencing continued prosperity. The general quota of orders on the books of the different manufacturers is still large. The latter are endeavoring to fill these as expeditiously as possible and at the same time take care of the late comers. The 55-hour system seems to be working very satisfactorily and everything is moving along nicely. The structural iron men are crowded with work, and now that the strike is settled, they are doing their utmost to keep pace with the building boom that has struck Cincinnati. Foremost among these new structures is the one to be erected at the southeast corner of Fourth and Walnut streets by the First National Bank. This building will be 19 stories high with a frontage of 66 feet on Fourth street and 198 feet on Walnut street, and will cost $700,000. Another architectural iron industry is to be added to Cincinnati's manufacturing enterprises, in which it is rumored that Cleveland capitalists will be interested. It is understood that they have recently secured a tract of land 147 x 400 feet, at the corner of Montgomery Pike and the Norfolk & Western Railway, on which to erect the plant. The ground in question was lately sold to W. F. Becker of Cleveland for $11,500. A building which at present occupies a portion of the premises will be utilized and become part of the new plant. Work, however, on the new structure will not be commenced until next fall. The railroads are gradually purchasing the necessary space for track room along the river front and will soon begin the work of removing all buildings that obstruct their right of way.

The Bradford Machine Tool Company, who met with a slight loss by fire, as previously reported, will begin the work of rebuilding at once, and hope within a very short time to be running as previously.

The American Tool Works Company report an exceptional activity in all departments and state that thus far the month of May has resulted in the best business in the company's history. Inquiries and orders are plentiful, with excellent promise of continued good business. Recent consolidations of the various departments in the works and the centralizing of the offices have greatly facilitated the operations of the plant. The new tools they have recently brought out have received very flattering indorsement by the trade, particularly the new "American" lathes, which are being sent out against orders as fast as they can be brought through.

Dreses Machine Tool Company are receiving their share of trade, both domestic and foreign. They are now shipping some of their tools to Sweden, Denmark and Italy. They have also recently received a large order for their tools for the United States Naval Station at Cavite, P. I. Their additional building will be ready for occupancy within the next 30 days, at which time they will probably be in the market for some large tools with which to equip the same.

Cincinnati Planer Company are actively engaged in taking care of orders booked some time since and are now prepared to make better deliveries than for some months previous. They are now fitting up their new pattern shop, which will be quite an adjunct to their plant. They are also receiving bids on a new 150 horse-power engine and generator with which to supply direct electric power to their shop.

Cincinnati Machine Tool Company, now located on Western avenue, have within the past few days closed a deal whereby they have secured a lot 150 x 200 feet on Spring Grove avenue and Township street, where they are preparing to erect a large and commodious shop. The new structure will be of iron and brick construction, three stories high, with a separate building to be used for offices. These buildings will contain all the latest improvements and will be ornamental as well as serviceable. When completed a new line of tools will be added and the capacity of their present plant will be multiplied.

Trade with the R. K. Le Blond Machine Tool Company during the past three months has been better than ever before. During this time they have booked more orders and delivered more lathes than at any time since their organization. They are now installing a new 400 horse-power Greenwald engine, made necessary by the exceptional volume of trade offering. The sale of milling machines also has increased to such an extent that they are now contemplating the erection of a new building for the manufacture of this class of tools exclusively. They have recently sold to Fosdick Machine Tool Company one of their large millers and have orders for two machines of the same pattern from the Lodge & Shipley Machine Tool Company.

Greaves & Klusman are well satisfied with trade conditions as they find them. They are still adding new tools from time to time as necessity compels, and are able to make deliveries much more promptly since the completion of their additional building.

Schumacher & Boye report business as excellent and everything satisfactory. They have been delayed very materially in the erection of their new building by the stone cutters' strike, but hope to have it completed within the next 60 days. They increased their equipment considerably during April, and with the completion of their new building feel that they will be able to take care of any business that may offer.

The Cincinnati Milling Machine Company are devoting much time to perfecting their plans for the expansion of their plant. These are developing very nicely and they hope within a very short time to begin the work of reconstruction. Trade is reported as excellent, with a general demand for their tools from all sections of the country. Foreign business is somewhat better but still irregular.

Bickford Drill & Tool Company report business excellent with a good, healthy general trade. One special feature of the volume offering is the very large orders being placed by many railroads throughout the country for shop equipment. They have now under construction tools for the American Locomotive Company and also for the Locomotive & Machine Company, Limited, of Montreal, who are erecting a large new plant. An officer of the company reports that he can see no reason why prosperity should not continue, and the way orders are coming in indicates a satisfactory year.

The Oesterlein Machine Company are moving along with work in sufficient quantities to satisfy the demand. They are constantly improving their cutter grinders, friction clutch and milling machines. They are now at work designing a larger milling machine, which they will have ready for inspection in the very near future. They anticipate it will be necessary within the next year to expand their plant, and they are now working for this end.

The Cincinnati Shaper Company, who recently moved into their new quarters, are doing a large volume of business with indications bright for the future. They are experiencing a good demand from the railroads and are sending many heavy shapers to the Pittsburgh district.

The I. & E. Greenwald Company, makers of engines and gears, are running to their full capacity, endeavoring to keep abreast with orders, which are coming in rapidly. Their increased capacity is being tested to its utmost and their shop presents a very busy appearance. They are now at work constructing a large heavy duty engine and boiler for the Ohio Knife Company, two large high and low pressure engines for the Otto-Marmet Coal Company, one large engine for Ault & Wiborg, one 400 horse-power engine for the R. K. Le Blond Machine Tool Company, one very heavy engine for C. A. Maisch & Co., a heavy duty engine for Cincinnati Milling Machine Company, and several large engine outfits for Texas points, to be used in the operation of cotton plants, as well as considerable machinery for white lead works in the South.

The Houston, Stanwood & Gamble Company, manufacturers of standard slide valve engines, are extremely busy. They have within the last few months added a new department, which is about completed. When finished it will be 55 x 275 feet and will add a little more than 200 per cent. to their floor space. They have installed a number of new tools, among which we mention one 60-inch Cincinnati planer, one cylinder boring lathe from Meadville Vise Company, one large radial drill, Wm. E. Gang & Co.; one 30-inch Lodge-Shipley lathe, latest pattern with turrent; one Schumacher & Boye 24-inch lathe with turret, and some small tools. They report their output for 1902 as having increased a little more than 50 per cent. over 1901, and so far this year sales and product exceed last year. They have recently shipped to the Cottonwood Coal Company, Stockett, Mont., a pair of 70 horse-power engines and a 70 horse-power engine and boiler to J. F. Paeltz & Co., Otway, Ohio; a pair of engines of 400 horse-power to Denver Engineering Works, Denver, Col., for mining purposes; a 200 horse-power engine to R. S. Newbold & Son, Norristown, Pa.; a pair of 100 horse-power engines to Zimmerman-Wells Machinery Company, Portland, Ore. They now have under process of construction 12 engines of 150 horse-power each for the West Virginia Plate Glass Company, Morgantown, W. Va.; a 100 horse-power engine with boiler for E. M. Freese & Co., Galion, Ohio, to go along with the brick plant; a 125 horse-power engine with boiler for Ceramic Engineering Company, Cleveland, Ohio, for brick plant service; one 150 horse-power engine and boiler for Otter Creek Lumber Company, Gainesville, Ga.; two engines of 150 horse-power for the Florala Saw Mill Company of Florala, Ala.; one pair of engines aggregating 400 horse-power for Southern Oak Extract Company, Knoxville, Tenn. Mr. J. W. Edwards, who for a number of years has been located in Cincinnati, is now at St. Louis, in the place of H. M. Houston. Mr. Houston will make his headquarters in this city, looking after the agencies and general trade in Texas, Louisiana and Mississippi. They expect within the next few weeks to establish an office in New Orleans to look after the local trade in that vicinity.

The Thomas Iron Company of Hokendauqua, Pa., have rescued and will preserve as a relic a very old engine said to be the first steam engine set up in Lehigh County, Pa. It was erected in 1837 by Joseph K. Seager, who in that year established a foundry and machine shop in Allentown. The engine was used for a time by the Thomas Iron Works.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 27, 1903.

Dealers in machine tools say there has been a pronounced falling off in the demand within the past 30 days. Strikes and rumors of strikes are the reasons assigned. The general expression is that so long as there is liability of strike it is not advisable to install additional equipment. The strike situation is not nearly so far reaching as it has been in years past after the "May Day" agitations. At the present time about 100 machinists employed in four shops are holding out for a nine-hour day and 12½ per cent. increase in pay. The strike of the brass workers, polishers and buffers, which started several weeks ago, is still on, but the men are gradually returning to work, the number still out being estimated at 400. This, of course, affects the machinery business to a a greater or less degree. The strike of the machinists is a rather peculiar one. There was no concerted action among all union machinists, as in former years, but the trouble has broken out in a number of the smaller factories, concerns which were particularly pressed with business and therefore likely to arbitrate matters. The chief attack has been made on manufacturers of automobiles and automobile parts and supplies, Cleveland being the acknowledged center for this class of manufacture. The demands were unexpected and well planned, for the manufacturers of these goods are loaded up with contracts for early delivery and it would simply mean the ruin of the business for the year to tie up at this time. The result has been that all but one or two of the 15 or more concerns in this line of business have arbitrated the matter and yielded points which they would not have otherwise conceded. The nine-hour day has been granted in nearly every case with an increase of from 5 to 10 per cent. The unusual point in these demands was that the employers were approached by shop committees representing nonunion as well as union men. Indirectly the fact of granting concessions has had its effect upon manufacturers of other lines, and it is understood that similar demands are being made on other manufacturers that seem particularly rushed with business and are in a measure defenseless. Quite naturally the automobile factories are now securing about all the help they require, rendering it more difficult for the ten-hour shops to secure workmen. But to the disinterested spectator the amusing feature of the situation is that in no case are the men earning more money per week than they did before the demands were arbitrated, since in practically every case they accepted less than the 12½ per cent. increase demanded.

The automobile industry is developing into a very important factor in the Cleveland situation. No less than 20 factories are engaged either in the manufacture of automobiles or accessories and some of them are employing hundreds of men. The Winton Motor Carriage Company are now turning out an average of six large touring cars per day, and this rate is steadily being increased through the installation of new machinery and additional help. The company are now erecting another large machine shop, which will greatly increase the output later in the season. The Cleveland Automobile Company, who buy their parts and assemble the vehicles, are turning out two cars per day, while the White Sewing Machine Company, the General Automobile & Mfg. Company, the Baker Motor Vehicle Company, the Hoffman Automobile & Mfg. Company and the Peerless Motor Car Company are each producing from one to two per day, while in addition to these there are a dozen smaller concerns averaging from two to four per week. Over 500 automobiles have been delivered to purchasers in Cleveland thus far this year and probably as many more have placed their orders and are awaiting the delivery of their cars.

The unexpected demand for automobiles and the inability to secure prompt deliveries of material, thus preventing the concern from realizing on their product, have resulted in the failure of the American Motor Car Company of this city. Last Friday the company were placed in the hands of a receiver upon the application of the president, George F. McKay. In his petition he stated that the company had debts amounting to $30,000, but that within six weeks the stock of automobiles on hand could be completed and would be worth at least $40,000. The court granted the petition and the company are now being operated by a receiver.

The C. O. Bartlett & Snow Company report an unprecedented demand for dryers and hoisting and conveying machinery. They are building a large conveyor outfit for the National Carbon Company of Cleveland and a dryer and conveying outfit for the Detroit Portland Cement Company, Detroit. The Coal Dust Firing Syndicate of Haydick, England, manufacturers of the Schwartzkopf system of coal dust firing, have investigated the merits of a number of American dryers, and have placed an order with the Bartlett & Snow Company for several outfits for use with their system.

The Garry Iron & Steel Company are meeting with great success in introducing their new line of electric and pneumatic cranes. They recently sold two electric cranes to the Republic Iron & Steel Company at Youngstown, one to the Standard Oil Company at Cleveland, one to the Louisiana & Arkansas Railway Company, a pneumatic crane to the American Car & Foundry Company, Detroit; two derrick cranes to the J. I. Case Threshing Machine Company, Fargo, N. D.; a pneumatic revolving crane to the Pere Marquette Railway, and five small cranes to the Duplex Mfg. Company, Elyria, Ohio. They are furnishing structural iron work for building for the Pennsylvania Stave Company, Sheffield, Pa.; structural work for a boiler shop building, 60 x 250 feet, for the Sterling Company, Barberton, Ohio; a gas plant building to the Kalamazoo Gas Light & Power Company, Kalamazoo, Mich., and structural work for a new power plant for the Zanesville Street Railway, Light & Power Company, Zanesville, Ohio. They have recently taken up the manufacture of steel bridges and are building a four-span 240-foot bridge for the Delaware & Magnetic Springs Railway, Delaware, Ohio, and highway bridges for Roseville, Ohio, and Triadelphia, Ohio.

Foot, Burt & Co. see no falling off in the demand for large multiple drilling machines. They are furnishing a 78,000-pound six spindle drill to the Chicago & Northwestern Railway, a large drill to the New Castle Forge & Iron Company, New Castle, Pa., and a large drill to the Cudahy Packing Company, South Omaha, Neb.

The Warner & Swasey Company have recently increased the size of their plant, but they are still considerably behind on order for their standard line of tools. Business during the past two or three months has been unusually heavy and they figure that their sales up to May 1 equaled those of the first six months of last year. The demand from foreign countries shows marked improvement over last year. In their instrument department they are very busy on a large order for range finders for the Government.

The Peter Gerlach Company, manufacturers of stave and barrel making machinery, have added a new department to their business, having acquired all patterns, drawings and machinery formely owned by the Alvin Streeter Company of South Hingham, Mass., and Alvin Streeter of Winchendon, Mass. The line consists of wood planers, automatic wood turning lathes, boring machines, automatic clothes pin machinery, pail handle machinery and pail, tub churn, freezer, cooler, fish kit, butter box, wood measure and dowell pin machinery. They are prepared to furnish full lines of these tools as well as repairs on machinery built by the above mentioned companies. They have also perfected and will manufacture a new steel wheel stave jointing machine designed for tight barrel staves. The machine produces a universal joint and, it is claimed, will save 5 to 12 per cent. in timber over stave joiners now in use. The Peter Gerlach Company are furnishing a complete plant of fish keg machinery to W. B. Lance, Gloucester, Mass., and an outfit of lime barrel machinery to the Saginaw Lumber Company, Saginaw, Ala.

The Standard Motive Power Company, who are erecting a large plant at Canal Dover, Ohio, for the manufacture of locomotives, are obtaining figures from Cleveland manufacturers and dealers for a considerable number of machine tools of the smaller type. A. P. Dodge, vice-president, is securing the estimates.

The Ajax Mfg. Company are recovering from the effects of their fire, and are now operating their machine shop. They were able to repair a large number of their tools and purchased only a few new pieces, among them two large milling machines. They are extremely busy endeavoring to catch up with orders.

F. H. Bultman & Co., manufacturers of gear cutting machinery and gears, have removed to a new shop in the Viaduct Power Building, 131 Viaduct, where they have two floors, 30 x 100 feet, nearly doubling their former capacity. They have installed a number of new tools and will devote greater attention than heretofore to the manufacture of their gear cutting machinery. They will also devote attention to the production of larger gears than in the past.

George H. Bowler & Co., dealers in second-hand machinery, have leased for a term of years the plant of the American Foundry & Machine Company, at Ravenna, Ohio, and will conduct it under their own name. The plant is new throughout. The foundry, which measures 75 x 200 feet, is equipped with the latest foundry appliances, and it will be used for general jobbing work in the heavier class of castings. The machine shop, 80 x 150 feet, will be used in repairing and rebuilding second-hand machinery, and in the production of a special line of tools, which they are not yet ready to announce. The general offices will be located in the Williamson Building, Cleveland.

The Loew Filter & Mfg. Company are erecting a large plant at West Madison avenue and Kilrain street, near the Lake Shore & Michigan Southern Railway. The main building will be 60 x 413 feet and two stories high. They are installing a 150 horse-power boiler and 125 horse-power engine, direct connected to a generator. A considerable amount of new machinery will be installed and it will be electrically driven. The greater portion of this equipment has already been purchased. They manufacture bottling machinery, brewers' supplies, filters and pumps.

The Acme Machinery Company say the demand for bolt and nut machinery is as heavy as ever. They recently secured a contract for a complete outfit of bolt and nut machinery for a factory to be erected in South America. The

order is a very pleasing one, as it was secured in competition with English and German, as well as American manufacturers of similar goods.

Bardons & Oliver, manufacturers of turret lathes, have moved into their new factory, at 10 Water street. They have about double the floor space that they had prior to their fire of several months ago. They are installing considerable new machinery.

The Victor Electrical Company are occupying a newly erected factory at Perkins avenue and the Pennsylvania Railway. They manufacture a line of electrical supplies and do electrical repair work of all kinds.

The Osborn Engineering Company of this city are preparing plans for a large Portland cement plant, to be erected near Columbus, Ohio, for the Ohio Portland Cement Company.

The Toledo Construction & Supply Company of Toledo have completed plans for the erection of a new machine shop and are asking for bids for the erection and equipment. The shop will be located on the new Terminal Belt Railway and Elm street. They will manufacture asphalt machinery.

The Toledo Castings Company of Toledo, who recently completed a new plant, have closed a contract for an addition which will double their facilities. Their line consists largely of railway specialties.

The Gendron Wheel Company of Toledo, manufacturers of toy wagons and bicycles, are preparing plans for an addition, 40 x 95 feet, which will be used for storage, enabling them to enlarge their manufacturing facilities.

The Cleveland Automatic Stoker Company, composed of Cleveland and Toledo people, have equipped a temporary factory in Toledo, where they are manufacturing their recently invented automatic stoker and furnace feeder. The company are planning to secure larger quarters, which will give them an annual output of 100 stoker outfits.

The Ideal Electric Mfg. Company have been formed at Mansfield by C. H. Voegele, John F. Stine, M. L. Branyon and others to manufacture electrical supplies and novelties. They are capitalized at $50,000, and are considering a site on which to erect their new factory.

The New York Blower Company of Bucyrus, Ohio, have installed an air compressor outfit and will utilize pneumatic tools for a large amount of their work. They have recently secured several large contracts, among them one for heating and ventillating equipment for the Chicago Post Office building and another for one of the largest buildings at the St. Louis Exposition.

The plant of the Illinois Car Company at Urbana, Ohio, have resumed operations after a shut down, the company having received a large contract for cars.

The Niles Car & Mfg. Company, Niles, Ohio, manufacturers of steam and electric railway cars, are adding to their blacksmith shop and machine shop and are installing several large steam hammers and additional machine tool equipment.

The Shelby Electric Company of Shelby, Ohio, are erecting an addition, 30 x 100 feet, two stories high, which will double their facilities for manufacturing electric lamps.

The Youngstown Electrical & Mfg. Company have commenced work on their plant at Struthers, Ohio. The main building will be 80 x 120 feet, and the second building, 30 x 40 feet. They will manufacture automatic recording scales for heavy work and a general line of electrical goods.

The Merrill Mfg. Company of Toledo will erect an addition to their foundry, 50 x 150 feet, and the present foundry will be transormed into a machine shop.

The plant of the Kenton Hardware Mfg. Company, Kenton, Ohio, was almost totally destroyed by fire May 20. The loss was about $100,000. The company are large manufacturers of metal toys. Officers of the company state that the plant will be rebuilt at once.

The Fairbanks Construction Company, Marion, Ohio, have commenced the erection of a new plant, which they expect to complete by November 1. They will manufacture a newly designed steam shovel and other goods of similar nature.

The Viking bicycle factory, at Toledo, one of the dismantled plants of the American Bicycle Company, has been sold to Kieper Brothers, Toledo, manufacturers of furniture. They will install steam heat, electric motors, electric elevators and electrically driven machinery.

A strong effort is being made to locate a rolling mill in Cincinnati. Plans of a Mr. Butts of Pittsburgh, Pa., have been presented to various Cincinnati manufacturers, and met with their approval, and the project is now to be presented to J. G. Schmidlapp, president of the Union Savings Bank & Trust Company of Cincinnati for his approval and co-operation in the financing of it. Mr. Lodge, president of the Lodge & Shipley Machine Tool Company, has been an energetic advocate of the project, and it is generally believed that a definite decision will soon be arrived at.

The New York Machinery Market.

NEW YORK, May 27, 1903.

Opinion in all branches of the machinery trade is that business is fully as good as can be expected under existing conditions. Some merchants go so far as to say that both orders and inquiries are very much better than they have had reason to expect. In view of the unsettled labor situation and the approach of the summer season, machinery merchants took it for granted that a perceptible falling off of business would ensue. There has been a slacking up of demand, but it was not as marked as anticipated. This is doubtless chiefly due to the fact that the amount of disturbance threatening the machinery industry was largely overestimated. Instead of a general labor upheaval spreading over the entire country, the trouble came up only in spots, and so far as the machinery industry is concerned has been in most cases disposed of without prolongation.

The machine tool industry is particularly fortunate in this respect. The important machine tool producing centers are free from disturbances and every indication points toward continued immunity for the balance of this year. As will be noted from the special report on the labor situation in New England, printed in another column, the Worcester and Providence centers are quiet. Cincinnati has not been threatened with trouble from her machinists this year, owing to the excellent organization of the employers. The Cincinnati machinists are well satisfied with the conditions under which they are laboring, and during the last two years the Machinists' Union has lost very heavily in its membership in this center. We have heard of little trouble in other cities containing large machine tool manufactories. In Syracuse and Rochester employers' associations are handling the situation well and the shops affected by strikes are being filled up with men brought from other cities.

The greatest amount of trouble is found in St. Louis. As will be observed from the telegraphic report printed in another column, the men are still out and the employers are standing together strongly. The Chicago district is threatened as is set forth in a special report in another column. In the New York district all hinges upon the result of a conference, which at this writing is in session, between the representatives of the New York Metal Trades Association and the International Association of Machinists. As previously stated in *The Iron Age*, the men have demanded a minimum rate of $3 per day for all now obtaining less than that figure, and an advance of 5 per cent. for all getting $3 or more. The demand is made operative on June 1. As the demands of the boilermakers were handled by this organization in a similar conference and settled by a compromise, it is generally believed in the trade that the present conference with the machinists will result similarly. The full text of the boilermakers' demands and the terms of settlement were printed in *The Iron Age* under the date of May 7, on page 25.

In some quarters of the trade the opinion finds expression that isolated cases of threatened labor disturbances will extend over the entire summer and that these will be of sufficient number to cause purchasers to hold back until the fall. Such people are, of course, looking for a quiet summer. Naturally there will be a falling off of business during the warm weather, but the fundamental prosperity now existing it is generally believed will prevent any serious business retrogression.

As a matter of fact, the great labor disturbances are in the building trades and much depends upon the outcome in this line of industry.

There is considerable interesting gossip in the trade concerning overtures which are said to be in process between the General Electric Company of this country and the Allegemeine Elektricitäts Gesellschaft of Berlin regarding a non-competitive agreement. It is stated that C. A. Coffin of the General Electric Company in this country and W. J. Clarke of the English Thomson-Houston Company are in Berlin discussing this matter. The general opinion held in the trade is that the agreement will be based upon geographical spheres, as, for instance, the American company agreeing to abandon the European and other fields for the privilege of having the entire American field to themselves. The outcome of this meeting is awaited with interest.

We are officially advised that the General Electric Company are planning the erection of another large machine shop to be built as an addition to their Lynn, Mass., plant. The building will be 350 feet wide by 650 feet long. One end of it will serve as a power plant with a capacity of from 2000 to 3000 horse-power. Nothing has been done as yet concerning the purchase of equipment for this building.

Purchases of shop equipment are being made by the U. S. Steam Turbine Company of New London, Conn., who have prepared plans for a new plant. The company intend building steam turbines from 10 to 5000 horse-power capacity. The buildings now about to be erected will but form a nucleus of a much larger plant. It is expected to have the first buildings ready in about two months. As soon as these buildings are equipped the plant will be extended. The first main building will be 100 x 150 feet, with 30-foot galleries.

The power house will be 30 x 40 feet. A 30-ton electric traveling crane will span the center of the main building.

Another project which has lately developed and which gives promise of placing some good sized orders for machinery is the Halsey Electric Generator Company, 129 West Seventeenth street, New York. Mr. Halsey, the president, has been circulating among the trade looking over some of the different makes, but as yet has made no purchases; nor will any be made until after July 1, at which time, we are advised, the company will be ready to take up the matter of equipment. Engineers are now at work on plans for a large plant which will be erected in the vicinity of New York for the manufacture of electric batteries in all sizes. These the company have been making for some time and have been so successful that they require greatly increased facilities. To provide for these improvements the capital stock has been increased to $10,000,000. The company are owned by the Guaranty Trust Company of New York, the president, Walter G. Oakman, being one of the directors of the Halsey Company.

Some equipment will be required by the Rogers Locomotive Company, Paterson, N. J., who are to erect a large tender shop. At present the tanks and frames of the tenders are made in different parts of the plant, but in the new building this work will be concentrated. The company are turning out a locomotive a day and are booked full up to next May. We can officially state that there is no truth in the current reports that negotiations are on for the sale of the Rogers Works to the American Locomotive Company.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until June 16, to furnish at the navy yards, Mare Island, Cal., and Puget Sound, Wash., cranes, elevators, tools, drills, electrical supplies, &c.

In another column a list of machinery supplies for the Eastern navy yards is printed. Bids will be opened June 10. No award has been made as yet in connection with the proposals for the New Orleans navy yard machinery equipment.

Orders are being placed by the Japanese Government for machine tools to be used in making gun carriages and similar work at the Government's arsenals at Kobe, Japan. Probably the largest order which they have placed in this connection was awarded to the American Tool Works Company, Cincinnati, Ohio.

The A. B. See Electric Elevator Company of Brooklyn, N. Y., and St. Paul Building, New York, who are building a new plant in Jersey City, as previously noted in these columns, are now considering the equipment end. At present the electric power problem is before the company. U. S. Barstow, electrical engineer, 11 Broadway, New York, having been retained in a consulting capacity in this connection.

Kane & Roach, builders of special rolling mill machinery, Syracuse, N. Y., advise us that they expect to build all of the traveling cranes and most of the machinery to be used in their new addition themselves. They are now designing and building special machines that will best meet their own requirements. They also state that it is probable that as soon as the present addition is completed further extension will have proved necessary.

Orders have been placed by the Mt. Carmel Iron Works of Mt. Carmel, Pa., for additional shop equipment. The orders placed thus far include a 42-inch Lodge & Shipley lathe, a 62-inch Rogers boring mill, a 5-inch Binse horizontal boring mill, a 2-inch Acme bolt cutter, a 125 horse-power tubular boiler and a 16 x 24 inch engine.

Equipment will soon be purchased by the Duquesne Motor Car Company, Incorporated, of Buffalo, N. Y., for a complete modern plant for the building of automobiles and the manufacture of automobile parts. The exact location for the new plant has not been definitely determined upon, for, while it was originally intended to build in Buffalo, flattering offers from other towns have caused the directors of the company to reconsider. According to present plans the new building will be a large one, and no expense will be spared to make it thoroughly efficient and economical in the way of machinery equipment. The officers of the company are as follows: President, E. Le Roy Pelletier; vice-president, John B. Uster; secretary and treasurer, John Fraser; chief engineer, William H. Brewster.

The Standard Oil Company are erecting at the Atlas works plant, Buffalo, N. Y., a brick car shop, 211 feet long and 101 feet wide, of one story, for the construction of steel tank cars.

Just what new machinery will be required will not be known inside of two weeks, but it is safe to say that the Central Iron & Steel Company of Harrisburg, Pa., will have to purchase a large amount of new equipment to replace that ruined in the fire which destroyed their original boiler plate mills May 22, entailing a loss of several hundred thousand dollars. The two mills were recently rebuilt, and not long ago the machinery was practically renewed, new boilers of large capacity added and electrical apparatus installed. While it is believed that some of the machinery can be saved, the greater portion is a total loss. The company advise us that they intend to rebuild and place the mills in operation as rapidly as can possibly be done. They are erecting, near the burned mills, an open hearth steel plant with six 50-ton furnaces, which they expect to have ready for use by next spring.

The Keystone Driller Company, Beaver Falls, Pa., whose plant was destroyed by fire some time since, have decided to rebuild at Beaver Falls, and have in process of erection a frame building which will be 80 x 130 feet, part of which will be two stories. It is their intention to put up later a fire proof building, 120 x 138 feet, part of which will be two stories. The plans for this building are under way and the erection of it will be started at an early date. As to what kind of machinery they will need after these buildings are completed, they do not know at the present time. They will not be in the market for any boilers or engines, but have bought a number of Gleason lathes and some Bickford radial drill presses. The frame building, which they have partly erected, will be used exclusively for the wood working department. As soon as the new building is completed the wood working machinery will be moved into it.

The plant of the Buffalo Weaving & Belting Company, Buffalo, N. Y., who were recently incorporated with a paid up capital stock of $200,000, is to be enlarged by the erection of two new brick buildings, one 50 x 150 feet, and the other, 40 x 100 feet, both one story. The new company are an incorporation of the business formerly carried on by John L. Chase and Rufus Mathewson, under the name of the Buffalo Weaving Company.

The orders for the equipment of the new plant of the South Atlantic Car Mfg. Company of Waycross, Ga., were pretty well scattered. The air compressor went to the Chicago Pnuematic Tool Company, and the Niles-Bement-Pond Company and Manning, Maxwell & Moore received the bulk of the machine tool business.

We have previously noted the fact that J. G. White & Co., 29 Broadway, New York, are to be contracting engineers for a portion of the equipment of the New York & New Jersey Railroad Company's plant. It will be recalled that Charles M. Jacobs is chief engineer for the latter concern, who are building a tunnel under the Hudson River between Jersey City and New York to be used for electric traction purposes. We are informed on good authority that J. G. White & Co. will soon have their specifications ready for the electric equipment, heating and ventilating apparatus, track equipment, &c. The procedure to be followed in connection with the purchase of engines, boilers, &c., we understand has not been determined upon.

It is expected that contracts will soon be awarded by the National Fire Proof Company of Pittsburgh, whose New York offices are located at 170 Broadway, for the equipment of the power plant to be built in connection with their new plant, now in course of construction near Perth Amboy, N. J.

The L. J. Wing Mfg. Company of New York, manufacturers of disk fans, steel plate blowers, exhausters, heaters, high speed engines and electric motors, who were consolidated with other firms in 1902 as the Colonial Foundry & Machine Company, with works and offices at South Norwalk, Conn., have withdrawn from that corporation and have reincorporated for the purpose of resuming their former business. The company are now occupying their old shops, at 251-253 West Broadway, which are fully equipped. L. J. Wing is president and Ralph Sullivan secretary.

The Columbia Smelting & Refining Works, 307 Water street, New York, and 56-62 Water street, Brooklyn, are selling the machinery, tools, &c., which composed the plant of the Process Copper Company. The equipment for sale includes a large number of patented iron flasks, 12½ x 18 x 5 x 6 x 7 inches, a steam cutting machine for brass castings, a magnetizing machine, a 10 horse-power White & Middleton engine, a 15 horse-power New York safety upright steam engine and power plant accessories.

A large contract for washing and similar machinery, to be installed in Colonel John Jacob Astor's new St. Regis Hotel, on Fifth avenue, New York City, has just been awarded to the Watkins Laundry Machinery Company of Cincinnati. We are advised that this will be the most complete equipment of this nature ever installed.

The American Well Works of Aurora, Ill., have arranged with P. Aubeck of 2-4 Stone street, New York City, for the representation of their full line of well sinking power and steam pumping machinery, air compressors, Chapman's compressed air pumping plants, gasoline engines, &c., in this market. Mr. Aubeck will also handle the company's export business.

The J. R. Vandyck Company announce the removal of their New York offices on June 1 to the Western Union Building, 8 Dey street, New York, where they will carry a complete line of high grade machine tools.

An Australian cablegram states that at the opening of the Federal Parliament at Melbourne this week Governor-General Tennyson remarked that the urgency of questions of domestic importance would prevent the immediate consideration of preferential trade, though the ministers regarded favorably the idea of closer trade relations between the British empire.

PERSONAL.

W. T. Graham, president of the American Tin Plate Company, is now in Europe. He is expected back in about a month.

G. G. McMurtry, president of the American Sheet Steel Company, will soon sail for Europe.

Henry R. Cornelius of Pittsburgh, for many years representative of the Southwark Foundry & Machine Company of Philadelphia, has taken entire charge of the output of the Brown Corliss Engine Company of Corliss, Wis., in the Pittsburgh district, with headquarters in the Frick Building.

Thomas Morrison, general superintendent of the Edgar Thomson Steel Works and blast furnaces of the Carnegie Steel Company, at Bessemer, Pa., has resigned his position, and states that he will retire from active business. He will be succeeded by Charles E. Dinkey, formerly assistant superintendent of the Edgar Thomson Steel Works. John Lewis, now master mechanic at the Edgar Thomson Steel Works and blast furnaces, will become assistant superintendent of the Edgar Thomson Steel Works and blast furnaces, and Daniel Seigh will become master mechanic of the Edgar Thomson furnaces, succeeding Mr. Lewis. Thomas Morrison, the retiring superintendent, is a nephew of Andrew Carnegie. He was born in Scotland, December 5, 1861, and was educated in the common schools of Dumfermline. In 1886 he came to America and located in Western Pennsylvania. His first position in this country was secured in the Homestead Steel Works as a machinist, and later he became assistant master mechanic and was promoted to be superintendent of the armor plate mills. It was only after he had made his way that Mr. Carnegie learned accidentally that he was a relative. In 1891 he became superintendent of the Duquesne Steel Works of the Carnegie Steel Company, a position which he held until March 1, 1895, when he succeeded James Gayley as superintendent at Braddock. Mr. Morrison is a director in the Carnegie Steel Company and one of the largest stockholders. On Friday evening, May 22, a banquet was tendered Mr. Morrison at the Hotel Duquesne, at the close of which he was presented with a chest of silver by his former associates and officials of the Carnegie Steel Company.

Allan F. McIntyre, for many years with the Cambria and other structural mills, has taken an interest in two structural plants at Chicago, and has opened offices at 510 Monadnock block, for contracting and selling all classes of plain and fitted structural material for building and other purposes, including plate and tank work.

W. C. McCausland, treasurer of the Carnegie Steel Company of Pittsburgh, has sailed for Europe, to be absent about three months.

Joseph E. Thropp, Jr., who a short time ago resigned his position of general manager of the Everett Furnace, coal and coke works, and iron ore mills, &c., has accepted a position with the Duquesne blast furnace department of the United States Steel Corporation.

On Wednesday, May 20, H. Lueg and son Ernest of Germany paid a visit to the Bethlehem Steel Company's works. They were accompanied by H. A. J. Wilkins of the New Jersey Zinc Company, of New York City. Thursday, May 21, a party comprising Baron von Rheinbaben, Prussian Minister of Finance; Herr F. Von Versen, United States Deputy Consul-General; Moritz Boker of Remscheid, and P. Glasenapp, engineer attaché, German Embassy, Washington, D. C., accompanied by J. K. Hand of J. P. Morgan & Co., New York City, also visited the works. The party arrived by special train from Philadelphia, and after going through the works were entertained at lunch by the steel company.

Charles Dorman of Dorman, Long & Co., Middlesbrough, England, has sailed for a visit to this country.

J. Gerald Branch, president and general manager of the National Oil Burner & Equipment Company, St. Louis, Mo., has been appointed boiler inspector for the city of St. Louis, the date of his service commencing May 14. Mr. Branch will retain his connection as president of the National Oil Burner & Equipment Company, but his official duties will make it necessary that he relinquish the office of general manager of the company.

Walter Scranton, president of the Lackawanna Steel Company, who has been seriously ill at his home in Vermont, is now recovering.

The Western Scrap Iron Situation.

INDIANAPOLIS, Ind., May 25, 1903.—A meeting of scrap iron dealers of Indiana, Ohio and Illinois was announced to take place in this city yesterday. Some kind of a meeting was held by eight or ten dealers, but those attending were uncommunicative. A few days since a dealer of Terre Haute, Ind., informed a local paper that the larger scrap iron dealers in the three States were to become members of the Indiana Scrap Iron Dealers' Association in order to oppose the United States Steel Corporation and the independent mills in their alleged effort to force down the price of scrap iron. The officers of the association were given as follows: L. J. Borinstein, Indianapolis, president; D. R. Cohen, Terre Haute, secretary; S. Finkelstein, Indianapolis, treasurer; J. R. Finkelstein, Terre Haute, traveling inspector. It was said that the territory was to be divided, both for buying and selling. The names of other members of the association were given, including Abram Feinberg, Harry Joseph and M. Cohen & Son, Muncie, Ind.; the Terre Haute Rag & Metal Company; A. L. Greenbery, Terre Haute; Hilton & Bauer, Cincinnati; Jacob Cohen, Jacksonville, Ill. For the purpose of the new combination other large dealers of the three States were to be taken in.

Mr. Borinstein declined to be held responsible for the news from Terre Haute. He would not even admit there is an Indiana Scrap Iron Dealers' Association, or that there are any officers of such an institution. He denied that the United States Steel Corporation had been beating prices down, and said they had always paid fair prices. More would be known about the alleged association in two weeks, as there is to be another meeting of the dealers then. He expressed doubt that a combination of scrap iron dealers to regulate prices would be practical, and if so, whether it would be of avail as against a great corporation like the United States Steel. One thing the dealers at yesterday's meeting had decided on, he said, was to pay only three-fourths of the amounts of drafts to shippers in the future.

The twenty-sixth annual convention of the National Electric Light Association met at the Auditorium Hotel, Chicago, on Tuesday, May 26. About 600 delegates were in attendance. After a short executive session the delegates gathered in the convention hall, where they were addressed by President Louis A. Ferguson of Chicago. A discussion of reports presented by T. C. Martin of New York and Walter M. Arthur of Chicago followed. In the afternoon papers were read by Sidney S. Hosmer of Boston, John S. Peck of Pittsburgh, A. Bement of Chicago and Henry A. Doherty of Denver. The convention will be continued Wednesday and Thursday of this week. Displays of electrical apparatus and supplies were made by manufacturers' agents.

The Wage Committee of the Amalgamated Association, headed by Theodore J. Shaffer, president, and John Williams, secretary, left Pittsburgh Monday night, May 25, for Detroit, Mich., where a conference was held commencing Tuesday, with officials of the Republic Iron & Steel Company for the purpose of arranging the puddling and bar iron scales. As the changes made in the scale this year were unimportant, it is believed there will be little trouble in effecting a settlement.

The molders of the several industries of Erie, Pa., who were on strike have received the advance of wages they asked, and have returned to work.

HARDWARE.

WE have recently had occasion to call attention to the marked evidence of enterprise and growth on the part of prominent jobbing houses. Our readers are thus reminded of the tendency in the great houses to become still greater, and to carry on their business with larger capital and in a more enterprising and aggressive manner. The consolidation of two prominent houses and the important increase in the capital stock of another, as noted in the following pages, are further illustrations of the same tendency. This progress is to be regarded in part as a result of the existing prosperity, in which the jobbing trade have naturally and fortunately secured an ample share. It is also unquestionably the result of skill and energy in the prosecution of business, for the houses who have made the most marked progress are acknowledged to be conducted with signal ability, and thus deserving of the success which justifies their enlargement. At the same time their attainment of increased proportions is undoubtedly in accordance with the spirit of the times, in which the tendency is toward great aggregations of capital and the conducting of business enterprises on an imposing scale.

The trade generally will note with satisfaction the holding of the conference between the Executive Committee of the National Hardware Association, representing the jobbers, and the officials of the National Retail Hardware Dealers' Association, representing the organized retail interests of the country, and the disposition thus evinced on the part of the two great divisions of the distributing trade to co-operate in efforts for the diminution or control, if may be, of disturbing influences which are antagonistic to both wholesale and retail merchants. There is no doubt that the direct reports thus obtained from the retail trade, who are in immediate contact with the condition of things for which a remedy is sought, served an admirable purpose in impressing upon the jobbing trade the reality and gravity of the difficulties under which the retail merchants are laboring, and the seriousness especially of the catalogue house competition. It was certainly made evident that retail merchants are permitted an entirely inadequate margin of profit, in view of the extremely low prices quoted openly by the catalogue houses on certain well-known goods, as a result of the low prices at which they purchase them. Their selling prices thus frequently approximate the retailers' cost. The necessity for doing something to correct this condition of things, if the Hardware trade are to continue to handle the goods in question, was emphasized at the conference. The association of retailers has thus officially brought the matter to the attention of the jobbers, and to a certain extent a similar presentation has been made in one way or another to some of the manufacturers whose goods are prominently handled by the catalogue houses. The finding of a proper solution of the problem obviously rests largely with the manufacturers and the jobbers, as the retailer can do little to better his condition in this regard except as he gives increased attention to the purchase of goods at the lowest prices obtainable, and thus endeavors to put himself in a position to meet existing conditions. Little more has thus been done than to recognize the elements of the problem with which the trade is confronted. The negotiations thus far are, however, only preliminary, and it is hoped that the thought and attention which will be given to the matter will result in the adoption of some policy which will be for the benefit of the trade. The entire harmony which characterized the gathering and the excellent feeling which prevailed from first to last between the jobbers and the retail merchants is a feature of the situation which reflects an admirable feeling and promises well for future co-operation. In this matter these two great divisions of the trade have almost identical interests, as the welfare of the jobbing trade is inseparably bound up with that of the retail merchants.

Condition of Trade.

The general situation, according to reports from manufacturers and wholesale merchants, has not materially changed since our last review. There is not as extensive buying on the part of the large trade as a month or two ago, and things are in a certain way comparatively quiet. The orders which are coming in are for immediate requirements, there being little disposition to buy except to meet early demands of customers. The course of the iron market is naturally watched with interest and something of solicitude, but while the trade are apprehensive of anything like a break in prices there is a general recognition that a moderate reaction from the extreme, and, indeed, abnormal, prices which have ruled would be for the permanent good of the trade, provided this can be done without frightening consumers and thus checking the demand for consumption. Notwithstanding changes which have taken place in the raw material there is a gratifying steadiness in the market and a confident tone. While the present lull in the purchasing of the large trade is a recognized feature of the Hardware market there is at the same time a great movement of goods into and out of the stores of the retail merchants, through whose hands they enter into consumption. There seems, too, to be no indication of a curtailment of enterprise, as business projects are freely undertaken and improvements and extensions of business are to be observed on every hand. The unrest in the field of labor and the serious disturbance of trade activities which results in many places is a feature of the situation which is decidedly unsatisfactory and threatens to interfere with the prosperity in which labor and capital are, it may be said, equally interested. Some of these contests tend to give strength to the market, as the tendency toward higher wages increases the cost of merchandise, while at the same time the complete or partial stoppage of works diminishes the supply of goods which enter into the market. When the strikes, as more generally the case, interfere with the consumption of manufactured products or their distribution throughout the trade there is no such compensation for the disturbance and loss which they entail. The fact that employers of labor are beginning to work together for the protection of their interests and to take a united stand against dictation from their employees meets with substantially universal approval from the public at large and gives ground for the hope that the present condition of disquietude may result in the correction of some of the evils under which the trade has for years been laboring. Agricultural conditions on the whole are promising, and taken all in all the outlook for a large and profitable business, both at home and abroad, continues excellent. The situation thus justifies an enterprising spirit in the prosecution of business, so as to make the most of the opportunities of the present, and the making of plans for the future in anticipation of a large and active demand.

Chicago.

(By Telegraph.)

From the standpoint of the manufacturer the past week has brought little change in the Hardware situation. In a number of important lines producers are sold ahead for many months. Other factories, however, note an unengaged capacity, and nearly all have experienced a falling off in recent orders, as is natural at this time of the year. Implement manufacturers especially report a slow trade. There has been a further falling off in staple lines as compared with previous weeks and also as compared with the corresponding time a year ago. In many respects this condition is traceable to the unsettled feeling resulting from the exorbitant labor demands, but the general impression seems to be that after a month or two of quiet during the summer a settlement of difficulties will bring about not only a revival of trade but a volume of business which will be even greater than it was a year ago. In jobbing lines there has been a fair degree of activity, but reports are somewhat conflicting, some jobbers reporting they could not well handle any increase in business, while others have capacity for handling many more orders than are being received. It is expected that as the prospect of a freight handlers' strike is realized in the country rush orders will be received in anticipation of the delay which may be occasioned after the first of June. At present a prospect of a repetition of last year's experience seems to be probable, but railroads are making more effective preparation than in 1902. One of the most important features of the jobbing trade at the moment is the scarcity in many lines of goods, most notable in Tin Plate, which is very scarce, resulting from the inability of the mills to obtain Tin Bars. There is a rumor that an advance in Tin Plate may follow, but this lacks official information. The few boxes changing hands at the present, however, are commanding a premium of $2 or more. The supply of Washers in this market is much reduced, carload lots being exceedingly difficult to obtain, and premiums are readily obtained for prompt shipments. The scarcity of Wire Cloth already noted continues, and those fortunate enough to have a supply are obtaining full prices if not an advance; scarcity is especially notable in Black Cloth, which now has preference over green in the country as well as in the city. Lawn Mowers, too, are not coming forward with the rapidity desired by the jobbing trade, and shipments of Refrigerators are somewhat behind contract time, but there has scarcely been enough warm weather to test the supply of Freezers on hand. In Builders' Hardware the large contracts which have been pending have made but little headway, the Chicago Post Office Building having been deferred for 30 days and the contract for the Custom House at Indianapolis being held up until July 1. The contract for the Railway Exchange Building is reported to have been taken by the general contractor but not placed with the Hardware manufacturers as yet. There has continued to be a fair order trade for both Builders' and Shelf Hardware throughout the country, a number of desirable small orders having been secured during the week, but the city trade has continued light. Jobbers who are in the market for Axes, Saws and certain makes of Hammers find it almost impossible to obtain early shipment because of the oversold condition of the manufacturers. There has been a moderate degree of activity in business for fall shipment, but aside from orders for Stove Pipe, Elbows, Stove Boards, Coal Hods, Axes, Lanterns and similar lines there has not been much activity, yet considerable contracting of this kind is expected during June. In Heavy Hardware, aside from Tin Plate and Washers, already referred to, supplies are ample to meet the wants of the merchant trade. Spelter has continued very active and strong, and is again higher, while Sheet Zinc has advanced very sharply, it being difficult now to obtain under 80 cents, Chicago. It is interesting to note that while business in Nails and Wire is falling off the largest interest in the market has orders booked which will keep the mills busy up to the first of September without taking additional tonnage.

St. Louis.

(By Telegraph.)

A general assortment of seasonable lines seem to be in steady demand, and business is keeping up very well. The largest jobbers at this point have been disturbed, jointly with some interests in other lines, on account of a strike of their porters and packers, and in consequence a sympathetic strike on the part of railroad freight handlers. While an exceedingly unpleasant situation exists it is not as bad as some reports make it appear. Shipments are moving forward, but necessarily slower than when the old experienced men were in command. It is thought signs point to a settlement which it is hoped will be brought about very shortly.

NOTES ON PRICES.

Wire Nails.—A moderate number of orders are being received by the mills, while shipments on old contract orders continue in fair volume. More promptness is observed in the making of deliveries. The market is firm and quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots	$2.00
Retailers, carload lots	2.05
Retailers, less than carload lots	2.15

New York.—The almost complete suspense of building operations within the city has a marked effect upon sales from store, but there is a fair business doing with outlying territory. The market is firm at the following quotations: Single carloads, $2.20; small lots from store, $2.25 to $2.30.

Chicago, by Telegraph.—While there has been a decided falling off in new business, it is notable that the mills are in possession of orders which will keep them busy for several months, and under the circumstances a firm tone prevails. There has been a moderate distribution by jobbers, with little disposition to court business by making lower prices. Official quotations continue steady at $2.15 to $2.20 in carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For galvanizing 75 cents per keg and for tinning $1.50 extra per keg is charged.

St. Louis, by Telegraph.—The demand for Wire Nails is in very fair volume. Jobbers continue to quote $2.35 in small lots from store.

Pittsburgh.—There is a fair demand and the mills are busily employed in taking care of new business and also on specifications on old contracts, which are coming in quite freely. The shortage in supply of Steel has about disappeared and car service is again very good. There is no change in prices, which are as follows: $2 in carloads to jobbers, $2.05 in carloads to retailers and $2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days; for galvanizing Nails 75 cents per keg is charged and for tinning Nails $1.50 per keg extra.

Cut Nails.—A meeting of the Cut Nail Association is to be held this week. It is anticipated that the conservative element will be in the majority and that no change will be made in existing prices. The continued scarcity of Steel interferes somewhat with prompt shipments from the mills. Quotations are as follows: $2.15, base, in carloads and $2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms 60 days, less 2 per cent. off in 10 days.

New York.—The demand continues steady, but is light on account of labor troubles in this vicinity. The market remains firm, and quotations for carloads and less than carloads are as follows: Carloads on dock, $2.29; less than carloads on dock, $2.33; small lots from store, $2.40.

Chicago, by Telegraph.—The scarcity of the intermediate products of Steel continues to prevent prompt shipments, and although new business is not of large proportions, the market has continued firm. Iron Nails are also in moderate supply and firm in tone. Sales con-

tinue to be made on the basis of $2.30 in carload lots, and $2.35 in less than carload lots for Steel, Chicago. Iron Nails are held at $2.45 to $2.50 per keg from store.

St. Louis, by Telegraph.—The call for Cut Nails is very fair. Jobbers' quotations are unchanged, as follows: In small lots from store, Steel, $2.35; Iron, $2.50.

Pittsburgh.—There is a good steady demand for Cut Nails, made up mostly, however, in carloads and smaller lots. The strike in the building trades in various sections of the country is interfering seriously with demand. Prices are firm, and are as follows: Steel Cut Nails, $2.15, base, in carloads and $2.20 in less than carloads; Iron Cut Nails, $2.25, base, in carloads and $2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—There is little delay at the mills in making prompt shipments, which include new orders for small lots and specifications on large contracts placed some time since. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$2.30	$2.60
Retailers, carload lots	2.35	2.65
Retailers, less than carload lots	2.45	2.75

Chicago, by Telegraph.—New orders coming forward are only moderate, but the difficulty in obtaining Billets is somewhat interfering with the filling of old contracts promptly, and the market has remained firm in tone. There has been a fair jobbing trade and a steady market. Galvanized Wire is selling on the basis of $2.75 to $2.80 in carload lots, and Painted at $2.45 to $2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Polished, $2.30 to $2.35, and Galvanized, $2.70 to $2.75, the outside price being to retailers.

St. Louis, by Telegraph.—A good demand continues for Barb Wire. Jobbers quote in small lots from store: Painted at $2.65, and Galvanized at $2.95.

Pittsburgh.—New business being placed is small, as the heavy contracts were given out some time since; in fact, before the advance in prices was made. Specifications on these contracts are coming in quite freely. The market is firm and we quote, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, $2.30; Galvanized, $2.60, in carloads to jobbers; Painted, $2.35; Galvanized, $2.65, in carloads to retailers; Painted, $2.45; Galvanized, $2.75, in small lots to retailers.

Smooth Fence Wire.—The market continues firm, with a fairly active demand. This, with the satisfactory specifications on contracts, keeps the mills busily employed. The market is firm at the following quotations, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.90
Retailers, carloads	1.95
Less than carloads	2.05

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12 & 12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—While new business has fallen off somewhat, specifications on old contracts are large and the tonnage already booked will keep the factories busy until September 1 without additional tonnage. Certain sizes of Galvanized Wire are especially difficult to obtain and prevent the filling of contracts of assorted sizes promptly. The market has continued strong in tone, the following being the prices current: Nos. 6 to 9 sell at $2.05 to $2.10 in carload lots on track, and $2.15 to $2.20 in less than carload lots from store, Galvanized bringing 30 cents extra for Nos. 6 to 10 and 60 cents extra for Nos. 15 and 16.

St. Louis, by Telegraph.—A satisfactory demand on the jobbing trade continues for Smooth Fence Wire. Quotations are as follows: No. 9, $2.30; Galvanized, $2.60, in small lots from store.

Pittsburgh.—There is quite an active demand, and buyers who placed contracts some time since are specifying on these at a very satisfactory rate. Prices continue firm but unchanged and are as follows: Plain Wire, $1.90, base, for Nos. 6 to 9 in carloads to jobbers, $1.95 in carloads to retailers and $2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Wrought Washers.—There has for some time been more or less of a scarcity of Wrought Washers. This has been owing to the large demand, coupled with the difficulty experienced by the manufacturers in obtaining raw material. There is, however, an improvement in the situation, and there has been less difficulty in shipping goods in sufficient quantities to meet the requirements of the trade.

Axes.—The Axe market develops but little change. The low prices which were established a few weeks ago continue without improvement. The existing prices are about 50 cents per dozen less than those of last year, notwithstanding the fact that owing to the increased cost of material and labor the goods cost 25 cents per dozen more than last year to manufacture. In the present condition of things the factories find consolation in the consideration that ruling prices being without profit, further decline is not to be anticipated. The extent to which manufacturers have recently been increasing their facilities is in good measure held responsible for the decline in the market, as a very active competition for current business is the natural result. While nothing is heard of the attempt at consolidation of these interests, it is suggested that the extremely unsatisfactory condition of the market may do something to induce the manufacturers to consider the desirability of some action which will remedy present conditions.

Pumps.—Manufacturers of Pumps report an excellent demand. Prices are referred to as unpleasantly low, considering the cost of the raw material and labor. The competition on this line has been active for some time, but the manufacturers have recently been conferring and reaching something of an understanding which is regarded as improving the situation somewhat. Little has been attempted, or at least accomplished, in the direction of advancing prices. The prospects for an active summer business are considered good, the demand having been stimulated by the dry weather which has prevailed. Some dealers who placed their regular orders for spring shipment are reported as already calling for the goods in advance of the date anticipated for shipment.

Paris Green.—The long continued dry weather and the more recent low temperature in this vicinity has caused a postponement of demand. Some manufacturers are trying to get an advance of ½ cent per pound on the following quotations, but former prices are probably procurable. The basis for asking higher prices is depleted stocks and the expected revival of demand with better weather conditions. Former quotations are as follows:

	Per lb.
Less than 1 ton	13½c.
Arsenic kegs or casks	14c.
Kegs, 100 to 175 pounds	15c.
Kits, 14, 28, 56 pounds	15c.
Paper boxes, 2 to 5 pounds	15½c.
Paper boxes, 1 pound	16c.
Paper boxes, ½ pound	17c.
Paper boxes, ¼ pound	

One to 5 tons, 1 cent per pound less; 5 tons and over, 1½ cents per pound less.

Cordage.—The demand continues active, especially for Sisal Rope. Manufacturers are having some difficulty in obtaining enough skilled labor to accumulate stocks of any large amount. Quotations are as follows, on the basis of 7-16-inch and larger: Sisal, according to quality, 9 to 10 cents; Manila, on the same basis, 12 cents per pound. A rebate of ¼ cent per pound is allowed on large lots.

Glass.—At the meeting of the National Window Glass Jobbers' Association, at which representatives of the American Window Glass Company, the Independent Glass Company and Federation Window Glass Company were present, considerable difference of opinion prevailed between the jobbers and manufacturers as to how large a quantity of Glass the jobbers should purchase, and what price they should pay for it. After a prolonged discus-

sion it is reported that the manufacturers issued an ultimatum in which they offered to sell 300,000 boxes at 88 per cent. off the list of January 1, to be specified before July 1, and to guarantee the market to August 1. This quantity was larger than the jobbers first offered to take, and smaller than the manufacturers first insisted upon their buying. The jobbers present could not agree upon accepting the manufacturers' offer at the meeting, and the matter was referred to the Executive Committee. It is considered doubtful, by some, whether the jobbers will or can take the allotment of Glass, though it is comparatively small, as most of them, especially in the East, are overstocked, owing to the absence of demand. It is reported that there is not entire harmony among the members of the jobbers' association, and that the attendance at the meetings is falling off. It is understood that the product of the three Glass combines will be sold by a central agency, and that the American Window Glass Company will act in that capacity. As the manufacturers have again entered into a selling agreement, and are willing to guarantee prices to August 1, it is supposed that the American Company will pocket the extra profits from their machine made Glass, at least until August 1, instead of giving the trade the benefit of lower prices. Quotations of the jobbers' association, for either single or double strength, are as follows:

	Discount.
From store	90 and 10 %
F.o.b. factory, carload lots	90 and 20 and 2½ %
F.o.b. factory, 2000-box lots	90 and 25 %

It is reported that some factories outside the combines have been offering Glass to large buyers at 90 and 30 per cent. discount.

Oils.—*Linseed Oil.*—The volume of business continues exceedingly moderate for the season. It has been the dullest spring in the Oil trade that has been known for a long time. Labor troubles have doubtless checked demand to some extent, but it has not been up to usual proportions any time since the first of the year. City Raw is quoted at 44 cents per gallon in lots of five barrels or more, and out of town Raw at 41 cents in like quantities.

Spirits Turpentine.—A gradual advance has taken place during the past week owing to reported strength of the Savannah market and to light stocks at this point. The demand here has been fair, though buyers have been holding off as much as possible in hopes of lower prices. Quotations, according to quantity, are as follows: Southerns, 54 to 54½ cents; machine made barrels, 54½ to 55 cents per gallon.

THE PHILADELPHIA CONFERENCE BETWEEN JOBBERS AND RETAILERS.

THE conference between the representatives of the National Hardware Association and those of the National Retail Hardware Dealers' Association, which was held in Philadelphia last week, is regarded as having been satisfactory as contributing to a better understanding in regard to some of the matters which are perplexing and disturbing the trade. The National Hardware Association was represented by R. A. Kirk, president; John C. Koch, vice-president; T. James Fernley, secretary-treasurer, and the following members of the Advisory Board and Executive Committee: William W. Supplee, H. H. Bishop, Samuel A. Bigelow, W. R. Belknap, P. E. Strauss and J. D. Moore. The retail organization was represented by its president, W. P. Bogardus, Mt. Vernon, Ohio; its secretary, M. L. Corey, Argos, Ind.; its treasurer, A. T. Stebbins, Rochester, Minn., and by T. F. Ireland, Belding, Mich.; L. Lindenburg, Dubuque, Iowa, and John R. Taylor, Little Falls, N. Y., secretary of the New York State Association. It was not attempted at this conference the first formal coming together of the two organizations so thoroughly representative of jobbing and retail interests, to consider all of the questions of mutual interest. Attention was centered chiefly on the matter of catalogue house competition, which is recognized as one of the most serious problems which confront the trade, affecting directly the interests of both jobber and retailer. The grievance in this connection is not the existence of such competition, which is recognized as inevitable, but the fact that many Hardware articles are made leaders of and are quoted by catalogue houses at prices which it is difficult and in some cases impossible for the retail merchants to meet. These prices frequently approximate the retailers' cost, and in some cases are actually below the prices ordinarily paid by retail merchants for the goods. One phase of the problem discussed was the manner in which this difficulty can best be met and overcome. Attention was given in some detail to the specific lines of goods in regard to which the retail merchants complain most bitterly, and the whole subject received a careful discussion. Various methods of overcoming the difficulty were suggested, and a disposition was manifested on the part of the jobbing trade and of manufacturers, so far as they were consulted, to unite in their efforts for the protection of the interests of the regular retail trade. It remains to be seen how much will be accomplished in this direction.

Both the jobbers and the retailers adopted separately the resolutions which are given below. These resolutions, while entirely general in their scope and not possessing great significance, are of interest as reflecting the harmonious relations and good feeling which characterized the conference:

The Retailers' Resolutions.

The Executive Committee of the National Retail Hardware Dealers' Association desire to and do hereby extend their heartfelt thanks to the Executive Committee of the National Hardware Association for their kind invitation to meet them in a joint conference, for the purpose of discussing the various methods that at present prevail regarding the distribution of Hardware throughout the country; and

Whereas, We believe that we have at this conference laid the foundation for a better understanding as to those methods which will be productive of much good to both the jobbers and retailers: now, therefore, be it

Resolved, That we do hereby pledge our best efforts to the continuation of the work now so well begun, and will heartily co-operate with the National Hardware Association in the future in all matters that will tend to accomplish results that will be of mutual advantage to both associations.

The Jobbers' Resolutions.

Whereas, At a conference between the officers and a special committee of the National Retail Hardware Dealers' Association and the officers and Executive Committee of the National Hardware Association, our attention has been called to certain evils which confront the retail trade; and

Whereas, We realize that our interests are mutual and that one branch of the Hardware trade cannot be injured unless the other is affected; therefore,

Resolved, That we reaffirm our previously expressed friendly feeling toward the National Retail Hardware Dealers' Association, and assure them of our desire as an association of jobbers, from whom they largely purchase, to lend them the power of our organization in correcting abuses which confront them.

A further consideration of the subject with a view to finding some practicable method of advancing the interests of the trade is left with representatives of the two organizations.

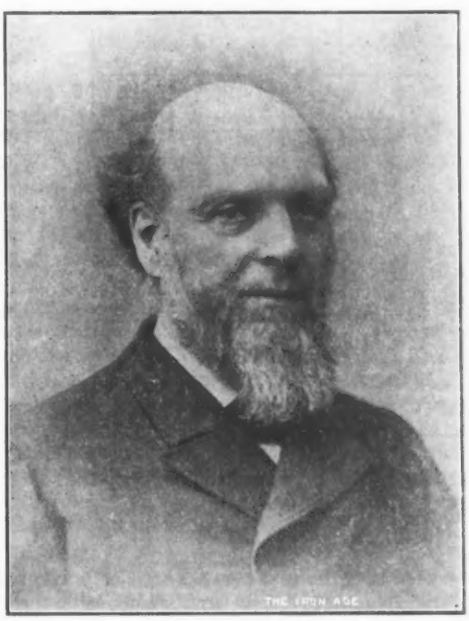
E. I. DU PONT DE NEMOURS POWDER COMPANY.

THE E. I. DU PONT DE NEMOURS POWDER COMPANY, Wilmington, Del., is the name of a new organization incorporated May 19, 1903, to take over under one head the business of the parent company, E. I. Du Pont de Nemours & Co., established about 150 years ago, and several subsidiary companies of like character in which they had a controlling interest, so as to consolidate into one compact organization the various elements, thus economizing in management, distribution of material and other essential details in the conduct of a great enterprise. It is said by those in authority not to be a new combination, as nearly all of the authorized capital of $50,000,000 will be needed to take in the interests they already control. The capital will be divided into $25,000,000 accumulative preferred and $25,000,000 common stock. There will be no bonds and no stock issued to provide working capital; likewise no stock issued to the public. Although the organization is still incomplete, the president is T. Coleman Du Pont and Pierre S. Du Pont, treasurer.

DEATH OF JOHN W. CLARK.

JOHN WOODRUFF CLARK of Landers, Frary & Clark, New Britain, Conn., died at the residence of his son-in-law, Dr. M. H. Hutton, in New Brunswick, N. J., Sunday, May 24, in his eighty-first year. He was born in the Stanley quarter, now a part of New Britain, and before his connection with the Hardware trade was a very successful salesman in the employ of Cochran & Co., who previous to the Civil War were large importers of and dealers in a general line of dry goods at 53 Chambers St., New York, where, curiously enough, Mr. Clark was manager of an entirely different kind of business a few years later. The extent of Mr. Clark's popularity as a salesman in the South may be inferred from the fact that sometimes in the busy season as many as 12 of the resident or house salesmen would be required on the same day to wait on his Southern customers in the various departments with which each was most familiar.

Mr. Clark's enforced retirement from the dry goods trade, as a result of war conditions, caused him to iden-



JOHN W. CLARK.

tify himself with the manufacture of Hardware in 1862, with what was then the Hart Mfg. Company, Kensington, Conn., but later better known as the Hart, Bliven & Mead Mfg. Company. His ability so increased the business, aided no doubt, however, by the war consumption, that his investment was doubled in about two years.

In the spring of 1864 he came to New York from Kensington to take charge of the New York branch of Landers & Smith Mfg. Company, New Britain, who then manufactured Cabinet Hardware, Faucets and Balances, with headquarters at 31 Beekman street, and who later were represented by the late Peter McCartee, who was subsequently prominently identified with the Stanley Works. In June, 1864, the business was incorporated as Landers, Frary & Clark, with a capital of $250,000, the business being moved to 53 Chambers street. About a year later the capital was doubled, making it $500,000, when the company began to make a full line of Table Cutlery in addition to the various kinds of Hardware they were already producing.

Mr. Clark retired from active participation in the business of the company in 1870, although always retaining his interest as a stockholder.

The Hagan Hardware Company, Marietta, Ohio, recently incorporated from the old firm of Hagan & Schad, have disposed of their store and business to Ben T. Seyler and Louis D. Strecker. The new owners have made a number of improvements in the old quarters and have also completed a new building in the rear of the present one. They are intending to incorporate a company with a capital stock of $100,000, and will continue the wholesale and retail business on an enlarged scale. The machine shop and tin shop will be kept in operation.

HIBBARD, SPENCER, BARTLETT & CO.'S CATALOGUE.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, have completed their new valuable loose leaf catalogue, containing 2460 pages, which is being distributed to the trade as fast as the issue is received from the binders. The publication department has been editing and compiling this work for nearly a year, employing at times a force of 18. Every page of the old edition has not only been revised, rewritten and rearranged, but a vast amount of additional matter has been supplemented. Extreme care has been exercised in the description of the various articles catalogued. One valuable feature is that weights of goods have been given, wherever practicable, to assist the trade in figuring freight. After two years' experimenting the firm have designed and put into effect in binding a special telescopic mechanism, facilitating the taking from and adding to the number of leaves in any portion of the catalogue. Besides a general index for ready reference, the catalogue has been arranged in 16 divisions, each section having from 100 to 200 pages, each division being numbered consecutively, the interval between divisions being left for additional pages to be inserted as required. The general divisions are as follows: Mechanics' Tools; Agricultural and Construction Tools; Builders' Hardware; Miscellaneous Hardware; Wooden Ware; House Furnishing Goods; Lamps, Lanterns and Sundries; Cooking and Heating Stoves; Sewing Machines, Bird Cages, Reed Furniture and Iron Bedsteads; Stationery, Scales and Store Fixtures; Harness and Saddlery; Cutlery, Sterling and Silver Plated Wares; Clocks, Watches and Cut Glass Ware; Guns, Pistols, Ammunition and Shooters' Sundries; Fishing Tackle; Sporting Goods and Photographic Supplies; Bicycles and Bicycle Sundries; Paints, Oils, Varnishes and Painters' Supplies. The book is profusely illustrated, over 13,000 cuts in all, 4000 of which have been specially prepared by the publication department. Small electrotypes have been given preference, facilitating the grouping and better illustration of the various lines of goods. It will be noticed that in illustrating Builders' Hardware half sized cuts have been used with scarcely an exception. In the Cutlery department, too, cuts have been much reduced, but without destroying the attractiveness of the pages. The cardinal principles upon which the catalogue has been compiled are made prominent on the fly leaf, and are as follows: "The real value of a catalogue depends upon its correctness. When bound in the ordinary manner a catalogue is out of date in a very few months. 'Correction slips' to be inserted by aid of the paste pot are not practical. New leaves for this book will be mailed at frequent intervals and can be substituted for the old ones with very little trouble. If the book is handled with ordinary care and the substitutions are promptly made this catalogue will be 'up to date' ten years hence." Preceding the title pages are colored lithographs of the main store, the warehouse, and a bird's-eye view of the Chicago River and Lake Michigan looking east. The main store, it will be remembered, is a steel fire proof building and was completed in April, 1903, and has already been described, with illustrations, in *The Iron Age*. The warehouse, which is 120 x 420 feet, was completed in May, 1902. The book in its present size weighs 16½ pounds, which, considering the voluminous matter treating of subjects so multitudinous, is very light, and the telescopic features of the binding make it possible to add several more pounds, which in a book of reference is not prohibitive. An illustrated page of directions explaining the mechanism of the binding accompanies each volume. A circular letter addressed "to our customers and friends," which contains a number of practical suggestions, accompanies the catalogue.

HARDWARE FACTORY COST METHODS.

A PROMINENT manufacturing concern, whose goods are widely known, refer to their lack of definite and satisfactory methods of ascertaining the cost of their goods as per the extract given below. It is not unlikely that their practice in this matter is representative of a good many other manufacturers who are content to meet, if they can, market prices, trusting that the result of the business as a whole will show something of a profit:

GUESSING AT THE COST OF PRODUCT.

We make but one article in various sizes, and the smaller sizes cost us more than the larger. We, however, to a great extent are groping in the dark, taking it for granted that to sell our product we must meet competition in our line. No doubt we do this without knowing absolutely whether there is a profit in a certain transaction or not, but believing our machinery is superior to others, in addition to more tonnage per man, we feel that we can meet prices of others for equal quality, and do so.

There may be cases where the course described by our correspondent is followed with satisfactory results, but as a general rule such disregard of the whole subject of costs in connection with the production of goods is attended with many dangers.

ADMINISTRATIVE AND FACTORY COSTS.

From a prominent manufacturer:—The question in regard to the distribution of nonproductive costs is a very broad one and much misunderstood. The way in which the matter should be treated depends greatly upon the nature of the material and the character of the goods manufactured. The point we desire to emphasize is that it is not correct to combine the administrative and factory costs. They should be added in quite a distinct manner.

A CONSTANT RECORD OF FACTORY COSTS.

From a Large Southern Manufacturer:—We fully agree with you that too much importance cannot be attached to the question of costs and further would emphasize the point that it is not sufficient in our judgment to know the costs at the end of the year. They ought to be known as soon as possible, certainly at the end of each month, and the accounts and books to be so arranged and so kept as to give the information promptly.

H. H. MAYHEW COMPANY'S COST SYSTEM FORMS.

The H. H. Mayhew Company, Shelburne Falls, Mass., manufacturers of Hardware and Mechanics' Tools, determine the cost of the articles which they make by means of cards, such as shown in Fig. 1. These cards are kept as a card index for easy reference. By referring to the illustration it will be seen that the name of the article manufactured is placed in the upper left-hand corner of the card. To the right of this is printed the words, "Cost per 100, Gross, Dozen." In the card shown it will be seen that the cost per 100 articles is recorded, because the amount $14.28 is written opposite the figures 100. This amount is found by adding up the elements of cost, which include the material used and the charge for labor expended in the operations which have to be gone through in the making, all of which are enumerated in the card. To the cost thus obtained is added 40 per cent., a fictitious figure in this case, to cover the general manufacturing expenses. While any calculated percentage is necesarily incorrect for some of the articles manufactured it represents the average proportionate cost of the total manufacturing expenses over and above the expense

Article ____ COST PER 100 Gross Dozen $14.28 MFG. EX 40% 100 Gross Dozen $19.99

Bending		Hardening	11	Tempering	13	Steel O. H			Boxes	20. for 70c	24
Beveling		Knurling		Testing		" Co.			Labels		03
Buffing	18	Marking		Twisting		" Tool	18 lbs @ 10	1.80	Cases		
Buzzing		Milling	73	Tapping		" Die			Paper		
Coloring		Machine Work		Tumbling		" Sheet			Glass		
Cutting up	02	Oiling	01	Turning		" Bessemer			Wire		
Cutting Screws		Plating		Assembling	30	Cast'gs Mal		2.00	Rivets		
Cupping		Podding		Boxing	04	" Iron					
Drawing	17	Pointing		Papering		" Steel					
Driving hds		Punching	04			Iron					
Dropping	14	Riveting				Handles		3.00			
Drilling		Scraping				Heads					
Finishing	31	Soldering				Washers					
Filing 1st		Strapping				Ferrules					
Filing 2nd		Straightening		Hours 20 @ 25	5.00	Screws					
Grinding	24	Shanking	09			Balls					
	1.06		68		6.47			6.80			27

Fig. 1.—Cost Card.

Article Castings - M. J. Sockets

Quoted by	Date	Firm and Address
J. Thos Smith Letter	8/4-02 10/2-02	Malleable Iron Co Boston

Size and Number	List	%	Net	F. O. B.	Frt.	Total
3/8 x 1 Pattern #22	Per 100 $2.00		$1.40	Mill	100 lbs	$1.48
5/16 x 1 1/8 " #23	4.25	30	2.975		10¢	3.13
1/2 x 2 " #29	6.00		4.20			4.39

Pattern via Ex to abor 8/10-02 Terms 3rd 60 days - 1% - 10 days

YAWMAN & ERBE MFG. CO., ROCHESTER, N. Y. PATD. JUNE 16, '91 DEC. 10, '95 41241

Fig. 2.—Material Cost Card.

of productive labor and the cost of material, both of which are shown on the card, thus covering such items as insurance, taxes, office expenses, superintendence, selling expenses, freight, depreciation, &c. In practice it has

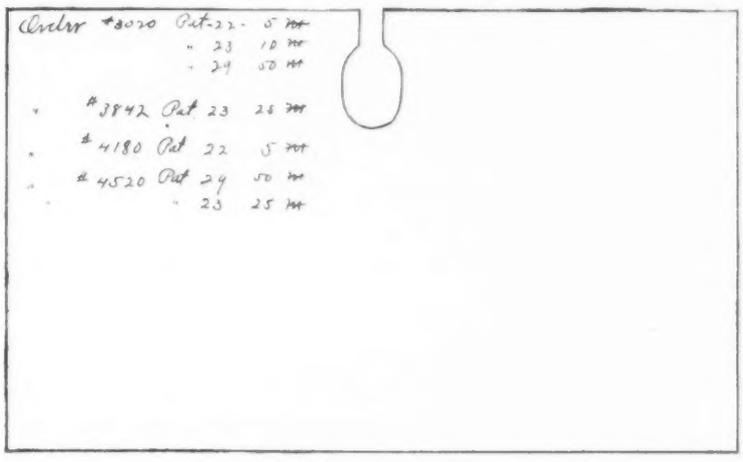


Fig. 3.—Back of Material Cost Card.

been found that the percentage for general expenses varies from 1 to 5 per cent. from year to year. The H. H. Mayhew Company say that they endeavored to follow another plan at first, based on the principle that the factory expense of some article was much less than others, but it was found to entail a vast amount of labor and they decided to adopt a uniform percentage and have found this much more satisfactory.

Another form used by this house is shown in Fig. 2. This is called a material cost card. Each article purchased for factory use is entered on one of these cards, the name of the article at the top, from whom purchased and the date below, and below this information regarding prices, &c. On the reverse side of the card shown in Fig. 3 note is made of purchases and quantities. This of course is filled up with suppositious figures to show the way in which the card is used. It can be made to give all necessary information for the ordering of material, checking up invoices, &c.

HARDWARE CONSOLIDATION IN THE SOUTH.

THE GRAY & DUDLEY HARDWARE COMPANY, Nashville, Tenn., and Mayberry Hardware Company, Birmingham, Ala., on May 22 consummated plans which have been in process of negotiation for some time, by which the two concerns will be merged in one organization to be known as the Gray & Dudley Hardware Company. Inventories of both stocks have been taken and the new *régime* will become operative June 1.

The officers will be R. M. Dudley, president; John M. Gray, Jr., vice-president; H. H. Mayberry, second vice-president; R. H. Dudley, Jr., secretary, and J. T. Jenkins, treasurer. In addition H. H. Mayberry and W. A. Chenoweth will be chosen directors, and Mr. Mayberry will be in charge of the Birmingham house. W. F. Stephenson, who has been with the Nashville house since its organization and who now has charge of the mail order department, will, it is thought, go to Birmingham as assistant manager. The old employees of both concerns will be retained and new ones added.

The Gray and Dudley Hardware Company were organized eight years ago by the amalgamation of Gray, Fall & Co. and Dudley Bros., with a capital stock of $200,000, which has since been increased to $500,000. They are jobbers of Hardware, Cutlery, Saddlery Goods, Machinery and kindred merchandise, and also manufacturers, owning, we are advised, five factories whose goods they market. The Mayberry Hardware Company, Birmingham, Ala., were established about 15 years ago in a modest way by H. H. Mayberry, now the company's president, who has had efficient assistance in developing the business from his brother-in-law, T. J. Watson. The capital stock of the company has increased to $200,000.

Last January the Gray & Dudley Hardware Company established a branch warehouse in Memphis, Tenn., which is said to have proved a successful venture, and with the new capital the facilities of the Memphis house will be largely increased and the adjacent territory canvassed more closely than ever, thus giving the new organization houses in Nashville, Memphis and Birmingham from which to carry on the business, in a field south of the Ohio River, including the Southwestern and Southeastern country. The Birmingham house will be operated on a much larger scale than heretofore and the staff of salesmen increased at that point by the addition of 12 or 15 men. They will not interfere with the territory or business of the Nashville house, but will look after Southern Alabama, Georgia and Mississippi, together with Louisiana, Florida and Cuba, giving especial attention to Mining and Manufacturers' Tools, Supplies and Machinery for the Birmingham district.

The old companies employed about 40 salesmen in the aggregate, which will be increased to nearly 60. It is expected that the volume of business will reach a total of $3,500,000 to $4,000,000 a year.

SOUTHERN HARDWARE JOBBERS' ASSOCIATION.

THE SOUTHERN HARDWARE JOBBERS' ASSOCIATION, who will hold their annual convention at Saratoga Springs, N. Y., July 14-17, simultaneously with the semiannual gathering of the American Hardware Manufacturers' Association, are issuing invitations to the trade generally to attend the meeting. The suggestion is also made that many of the members and others will be accompanied by ladies, and it is hoped that a large representation of the fair sex will be present, in view of the interest and attractiveness of the place of meeting. The plan of numbering and indexing all who attended the meeting at Atlantic City last year proved so satisfactory and acceptable that the Executive Committee have decided to follow the same plan in connection with the Saratoga gathering. Accordingly each delegate and visitor will be given a number and from these numbers an index will be prepared, copies of which will be printed and distributed to all who attend the convention. Button badges will be prepared, numbered from 1 to 800, or more if necessary, the index, of course, being similarly numbered and also alphabetically arranged. These buttons will be forwarded to delegates and visitors in advance of the meeting, and it is suggested that they be worn from the time of leaving home until the convention adjourns. In this way strangers traveling together to the convention may make themselves known to each other and the pleasure of the trip be thus materially increased. Early advices are therefore requested by C. B. Carter, secretary-treasurer of the association, Knoxville, Tenn., as to the names of parties who are intending to be present at the convention, so that buttons may be forwarded and the names incorporated in the index pamphlet.

W. B. BELKNAP & CO.

UNDER date May 23 W. B. Belknap & Co., Louisville, Ky., filed amended articles of incorporation increasing their capital stock from $1,000,000 to $2,500,000. Of this capital stock $1,000,000 is to be preferred 5 per cent. cumulative, in semiannual payments of 2½ per cent., and $1,500,000 common. Stock to the amount of $750,000 preferred and $865,000 common is now fully paid and outstanding, leaving the remainder of the stock for extension of business, to be issued as authorized from time to time. The application for this increase of capital stock is signed by William R. Belknap, Morris B. Belknap, C. J. F. Allen, William Heyburn, John W. Price, Harry S. Perkins and

Lafon Allen as directors. The trade will welcome this renewed evidence of enterprise and prosperity on the part of this great house.

THE TRAVELING SALESMAN HIS METHODS AND CONTROL

BY SAMUEL MASTERS.

CHAPTER XIX.—SALESMEN'S SALARIES.

IT is self evident that a salesman should be paid in accordance with the value of his services, and it is as easily understood that if each man is paid in just the proportion of his value no two men will receive exactly the same amount, although all will be paid on the same basis. To arrive accurately at a basis for remuneration it is necessary to make the profits of the business done the foundation, for it is the profit that proves the salesman's value. To figure upon the gross sales is misleading, for the man who strikes the bottom price every time and thus makes the minimum of profit stands the best chance of selling the greatest quantity of goods. So the best plan is to pay the salesman a specified percentage of his gross profits. This is the plan generally followed by the Hardware jobbing houses.

Commission Covers Salary and Expenses.

One of the annoyances in dealing with salesmen is the auditing of their expense accounts. Some men travel much more economically than others, and to hold the free liver down to the basis of his more economical brother works at times an injustice. The easiest and simplest way out of the whole matter is to make the percentage of the gross profit that pays the salesman high enough to cover a reasonable traveling expense and let the salesman audit his own expense account. This, too, is the method generally employed, the percentage of profit most generally paid ranging from 40 to 50 per cent. of the whole.

Guaranty to Cover Expenses.

This is a good basis on established routes for salesmen who have become acquainted with the trade and have an established patronage. New men on old routes, or old or new men on new routes, cannot live upon this basis, for their sales at the beginning would not support them; therefore it is necessary to guarantee the salesman enough to keep him going until he has gained a footing, and the practice is to fix a guaranty slightly above the amount actually required for hotel bills and carefare—say $1200 to $1500 per year. If the salesman is old upon the route or an especially desirable man whose success is assured from the start the guaranty is often made much higher—from $2000 to $2500 per year—but in such cases it is expected that the salesman will exceed his limit after a very short time.

Guaranty Should Exceed Bare Cost of Traveling.

A man cannot travel long upon $1200 per year. In even the most populous sections, where rides are short and trolley cars can be pressed into service, the cost of traveling exceeds $4 per day upon an average. A man should not go out unless he can reasonably expect to make his percentage net him $2000 per year after the first month, nor should a jobber start his men out with less. Many a route has been dubbed unprofitable and many a salesman has been pronounced a failure because at the beginning, when the work was hardest and the results most meager, he found himself unable to keep within the limit of his guaranty. It is especially hard upon him if he is a married man and has a family to support out of an allowance that would barely keep him going. If he diverts from his traveling fund enough to feed and house his family he has not enough left to pay his bare traveling expenses, and even the most desperate situations would hardly warrant him in making the trial. Two thousand dollars per year as a guaranty is little enough for a good man—and a poor one is dear at any price.

Published Costs Not Always Actual Costs.

The compensation of the salesmen is figured upon the published costs. It is no secret either among salesmen or their employers that there is at times a margin between the real cost and the published cost. There are times when it would be impossible to give the salesmen the real cost, as, for instance, when the jobber is given a special confidential discount beyond a price agreed upon by an association of manufacturers. To give the salesmen this extreme cost would be to violate the jobber's agreement with the manufacturer and would also, in nine cases out of ten, eventually lead to the detection of the manufacturer. Again, the jobber gets from the manufacturer a concession which makes the goods cost him less than the competing jobbers are paying. He dare not issue the actual cost, even though he give his men an arbitrary selling price, for it would probably end in breaking the market and the loss to him of any advantage from the concession. So he issues as his cost the general price to jobbers and holds the balance in reserve.

Salesman's Share of Extras.

Every buyer who is worthy the name has upon his confidential rebate book the names of dozens of manufacturers who allow a confidential discount at settlement. These figures he dare not issue, and very often, where the jobber can honestly claim the discounts as something beyond the ordinary and due to his superior purchasing ability rather than any trade condition, the salesman gets no benefit from the concession. In others, the cost clerk, who figures the profits on the sales, is given the extreme cost and figures the salesman's profits accordingly. The measure in which this is done depends largely upon the conscientiousness of the jobber and the conditions of the market. Neither does the salesman get any portion of the saving effected by taking cash discounts on the jobber's purchases. This the financial man claims is a just return for the investment necessary to enable him to take advantage of the time discount, and not any part of the regular purchase and sale.

Selling Expense an Enormous Burden.

But cut corners as he may and save out all that he can, the jobber pays dearly enough for his road representation. For every man on the road there are at least three in the house, and out of the 60 per cent. remaining of the gross profit the jobber must pay home salaries, the expense of running his business and get a fair return upon the capital invested. It is not to be wondered at that he finds the selling expense a serious burden and seeks in various ways to cut it down. Neither is it any wonder that the catalogue houses are able to sell at a less expense, and hence can at times cut under his prices and still make a greater profit than the jobber. The mere fact that it costs such a sum to sell the goods is all the argument needed to demonstrate that there is a grievous waste and that some more economical method should be devised.

Commission Basis Most Economical.

There are many advantages in putting a man upon a commission basis, and the expense to the jobber is less than upon a salary-and-expense plan. The ordinary salesman feels that his life is at the very best a wearing one, and that he is justly entitled to all the comforts provided by the best hotels. At times this feeling leads to extravagance if the house foots the bills, but if the salesman's own pocket is touched by extravagances he is very apt to find that just about as much comfort can be purchased for considerably less, and there is not the same desire for the best room and the finest fare, thus the expenses of the road are perceptibly reduced and the business done as well, and both jobber and salesman share in the saving.

Salesmen Must Exceed Limit.

The fixing of a guaranteed minimum remuneration is also a good thing. If the jobber is conscientious and fixes a sum that is fairly liberal he loses nothing by it with good men, and he should make an invariable rule to rid his force of men as soon as they demonstrate their inability to exceed the limit under fair conditions, or, if the fault is in the way the territory is laid out, he should revise the route to give the salesman a chance to demonstrate his ability, or if that is impossible, drop it

altogether. If a man cannot sell $30,000 worth of goods in a year, he cannot make a permanent success of his route. The percentage of profit varies, of course, with the character of the goods sold.

Profits Figured After Orders Are Filled.

Profits are, of course, figured upon filled orders. Collection expenses and drawbacks which occur outside of the regular selling process are borne solely by the jobber in most cases, such as freight allowances on back orders, allowances for damaged goods or to correct errors in shipment. Rebates in prices or other deductions of similar nature should be borne jointly by jobber and salesman. When a salesman plainly exceeds his definite instructions and there is a consequent loss of profit he should stand it all.

Letters From the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Syndicate Buying.

From a Wholesale Hardware Merchant:

Taking a broad view of the situation from the standpoint of a jobber doing a fair business, with quite a number of salesmen on the road, I do not hesitate to say that I do not approve of the system of syndicate buying. To "hit the nail squarely on the head," this system benefits the small dealer—the man who has not the time, the ability, the opportunity nor the orders of sufficient size to keep him in touch with the lowest prevailing prices. If syndicate buyers did not have heavy dealers on their list, who placed orders through them, they would not command the respect of the manufacturers. What the manufacturers want is tonnage. The orders of their larger customers give the syndicate buyers standing. Their small customers therefore derive the benefit of the orders placed by their larger clients.

Benefits Small Dealers

I believe the larger class of buyers in the Hardware line are making a mistake to encourage syndicate buyers. We should depend upon ourselves and our own buying strength. If, through the weakness of any of our buyers, we are overcharged on certain lines of goods, if we cannot find out through natural channels that we are not right on these goods, then we should have no cause for complaint. In buying, as in other things, it is often true that "ignorance is bliss where 'tis folly to be wise."

Mistake to Encourage

A strong man should be able to walk without crutches—a crutch is a sign of weakness. I look upon a syndicate buyer as a crutch upon whom the weak will learn to depend. Strength is developed by standing alone, by self confidence, by realizing that we must pay the penalties that follow our own carelessness or weaknesses. If we are to depend upon the syndicate buyer to purchase our goods, why not employ an expert warehouse man to store them; an expert order filling company to take care of our orders; an expert traffic man to handle our freight; an expert selling agency to dispose of our goods, and an expert banker to handle our finances? There is no more reason why there should not be specialists and experts in these various departments than in buying. If we carry out this idea to an absurdity where does the jobber find himself?

Use of Outside Help

In my opinion the successful jobbing houses of the future must consist of a combination of experts and specialists within themselves. There must be expert buying, expert selling, expert stock handling, expert warehousing, expert traffic management, expert accounting and expert financing. All of these various departments must develop strength within themselves, and then we have the ideal business. But if we are going to depend upon outside help, then we not only confess our weakness, but we are too timid to strike out and regain our strength. SECUNDUS.

Expert Buying

Jobbers' Retail Departments.

In reply to the inquiry in a recent issue made by a jobbing house in regard to the principles which should be observed in the management of their retail department, we have the following from a well-known retail Hardware house in Minnesota:

In the current issue of *The Iron Age*, under the heading "Management of Retail Departments," you ask for advice for a jobbing house. As a humble retailer let me suggest to Mr. Jobber: Quit retailing; every man to his trade; let the shoemaker stick to his last, &c. No jobber should try to sell me and my customers, the consumers, also. Jobbers retailing causes friction, and friction engenders heat, and heat burns the fiber which should join both jobber and retailer in friendly relations.

SMITH & WESSON'S LABOR TROUBLES.

THE fears of the workmen of Smith & Wesson, Springfield, Mass., who have been attempting to unionize the shops, that the concern would shut down the plant, were realized on the 25th inst., when the following notice was posted:

This factory will close to-night and remain closed until further notice for purposes of reorganization. Wages will be paid at the office on receipt of statements. Any of our employees who are desirous of resuming work upon the reopening of the factory will kindly communicate with the superintendent.

The next morning a large proportion of the men presented themselves anxious to give notice of returning to work. They filed into the offices and 387 of the 500 employees signed the following statement before Tuesday night:

I hereby affirm that I am a member of no labor union whatsoever, and agree that I will not join any such union while in the employ of Smith & Wesson without first notifying them in writing of my intention of doing so.

The plant will be opened again for operation next Monday, when a new schedule of hours will go into effect. Instead of working 60 hours a week as heretofore the men will work but 55, obtaining a half holiday on Saturdays.

Smith & Wesson do not believe in unions and have always declined to employ union men. The workmen have had no grievance as to wages or hours. They made no request for a shorter day or more pay. They were well paid and their only grievance appears to have been that they had no union. Since the men began the agitation the firm have taken rigorous means of preventing the union from getting a foothold. A number of men have been summarily discharged because they were known to have joined the union in the face of the shop's rule that none but nonunion men will be employed. No exception was made where workmen were known to have accepted office from the union. Six men were discharged for this reason last Saturday and others had gone before them.

CARL EICKHORN'S SWORD CATALOGUE.

CARL EICKHORN, Solingen, Germany, has issued a copiously illustrated catalogue of Swords, Cutlases, Daggers, Fencing Equipments, &c., containing 79 pages, each 16 x 9½ inches, with flexible cover. The engravings are one-quarter actual size, except the Fencing Equipments, which in addition to the numerous kinds of Swords, include Fencing Jackets, Masks, Gloves, Fencing Spectacles, Swathing Bands, Belts, Arm Guards and similar goods, one-eighth size. The Swords range in style from regular service Swords for army and navy to those for police, firemen and society officials, and are shown with accompanying Scabbards, all large enough to give an adequate idea of designs, from real Turkish and Rose Damask blades down to those more moderately priced. The descriptive matter throughout is in four languages, German, French, English and Spanish.

TRADE ITEMS.

UNTIL further notice the sales offices of the American Can Company for the States of Oregon, Washington and Idaho will be located at 539-540 Worcester Block, Portland, Ore., and 1317 First avenue, Seattle, Wash. I. H. Amos, division sales agent, will be in charge of both offices.

Two important patents on Hay Carriers have recently been issued to P. A. Myers, and assigned to F. E. Myers & Bro., Ashland, Ohio, covering the construction and mechanism of the unloader type of Hay Carrier for single and double rail steel track, now being put on the market by this concern. The manufacturers remark that machines built under these patents have now been on the market long enough to prove that the construction and style is a favorable one and approved by the trade.

B. F. AVERY & SONS, Louisville, Ky., Agricultural Implement manufacturers, have increased their capital stock from $582,000 to $1,400,000, the new stock being divided into $900,000 preferred and $500,000 common. For each share of the old stock every stockholder will receive a share of the new preferred, and $465,000 of the common stock will be pro rated among the present stockholders, being a stock dividend of 80 per cent. The remainder of the stock, both common and preferred, will be held pending sale as treasury stock.

AT the annual meeting of the National Association of Disk Harrow Manufacturers, held at the Auditorium Annex, Chicago, May 14, it was unanimously decided, after thorough discussion of the subject, that an advance in the price of Disk Harrows would be advisable, but as an association no action was taken. It is understood, however, that the manufacturers individually will act in harmony with the general sentiment.

A REGULAR MEETING of the Chicago Retail Hardware Dealers' Association was held at the Masonic Temple on Friday evening, May 22. The most important business which came before the association was the preparation for the annual picnic, which it has been decided to hold July 15 at Northwestern Park. A general committee was appointed as follows: W. H. Bennett, chairman; Fred Ruhling, Chas. A. Dalson, Geo. A. Englehart, J. L. Smith, Hans Fehr and W. B. Costello. Chairman Bennett will appoint subcommittees, among whom the work will be apportioned.

ON Thursday evening, the 21st inst., William W. Supplee, president of Supplee Hardware Company, Philadelphia, entertained his employees at a shad dinner in the banqueting hall of the Bourse Restaurant. One hundred and twenty-eight of the employees seated themselves at the four long tables that completely filled the room and discussed a choice *menu*. The guests were entertained by instrumental music and songs from noted specialists in their line, and listened to addresses from the president and various members of the company and heads of departments. During the evening Mr. Supplee was presented with a pair of high power field glasses, a gift of the employees, for use on his trip on the other side of the water during the summer months. Although a large number of the force were represented, very few of the large corps of traveling men were able to be present, it not having been deemed advisable to call them in off the road from their widely scattered fields of activity.

W. R. GRAEF, senior partner of Graef & Schmidt, 107 Chambers street, New York, sole agents for J. A. Henckels, Solingen, Germany, sailed May 28 for Europe on the steamer "Bluecher" of the Hamburg-American Line. He goes over, as is his custom annually, to select new goods in the line of Cutlery for the fall trade. Mr. Graef will return in September, and while abroad will meet Mr. Schmidt, who went across on similar business in March, and who will return in July.

THE CORTLAND SPECIALTY COMPANY, Cortland, N. Y., whose plant was completely destroyed by fire last October, are just about to move into a well appointed new plant. In addition to Banner Welding Compound, formerly made, they are intending to manufacture Brazing Compound and Boiler Compound.

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Retail Hardware, Implement and Vehicle Dealers' Association of the Indian Territory

THE fourth annual meeting of the Retail Hardware, Implement and Vehicle Dealers' Association of the Indian Territory was held in South McAlester on the 12th and 13th inst., in Masonic Hall. The meeting was called to order on Tuesday afternoon by Second Vice-President E. C. Stretch of Vinita, who introduced Mr. Gordon, acting mayor of South McAlester, who welcomed the association. The attendance was very light, not to exceed 20 dealers being present at the opening session. After the address of welcome opportunity was offered for any dealers present who were not members to join the association, and several new names were added. On account of the light attendance and the absence of the acting president, who was expected on the evening train, the meeting adjourned until 8 p.m.

Sales to Consumers.

The evening session was called to order at 8.30. Additional members having arrived on the evening trains, the attendance was better than at the opening session. Secretary Frazee called the roll and read the minutes of the previous meeting. No set programme having been arranged, the meeting was thrown open for the discussion of any matters of interest that those present might wish to take up.

G. M. Chaney of the Chaney-Becker Trading Company stated that he frequently saw goods on the depot platforms that had been shipped by manufacturers and jobbers direct to consumers, and he thought members of the association should report such cases to the secretary, to be taken up with the offending parties. The chairman announced that the association was formed for that very purpose, and that unless dealers reported such cases the association would fail of its purpose and had no right to exist.

Secretary Frazee made a like statement and further stated that he had repeatedly written to members urging them to do their duty in this direction, but that he had not received a single complaint during the year, and that dealers had shown a lack of interest.

J. B. McBride of Spiro said that he and other dealers in the territory tributary to Ft. Smith were constantly losing trade because the jobbers of that city sold to consumers as cheaply as they did to dealers, but acknowledged that he had never made any report to the secretary.

The discussion having been started, it soon became quite animated, and was participated in by S. Crowe, J. D. Gee, J. B. McAlester, A. L. Severance, L. Becker and G. H. Coppin. Mr. Severance said that when he found the jobbers selling to consumers or to general stores not regularly in the trade, he simply declined to patronize such houses, but did not tell the traveling men why. Mr. Becker said he thought the traveling men should be told why, that they might report the reason to their houses. Mr. Crowe said he thought the matter should be reported direct to the secretary, while Mr. McNabb said he thought the two plans should be combined to be most effective.

The discussion lasted over an hour and was quite spirited, showing that the few dealers in attendance were interested in the association work, and it is evident that another year will show better results.

Before adjourning a message was received from the Commercial Club inviting the association to go on an excursion on Wednesday afternoon to the mining towns. The meeting then adjourned until 9 o'clock Wednesday morning.

WEDNESDAY MORNING SESSION.

The meeting was called to order by Vice-President Stretch at 9.45. The call of the roll showed that more members had arrived on early morning trains, including Acting President Parkinson, who had been detained at home on account of sickness. Mr. Parkinson, who was elected first vice-president of the association at the meeting held last year, has for the past month or two been acting as president on account of the resignation of J. G. Smith, the condition of whose health required his relinquishment of all business cares.

The following committees were appointed: On Resolutions, J. N. McNabb, L. Rosenbaum and H. C. Beckman. On Nominations: A. L. Severance, J. E. McBride and G. H. Coppin.

Secretary's Report.

The secretary's report was then read as follows:

As your secretary for the past year I have little of interest to you to report. There has been no interest whatever shown in the association work by the members throughout the territory the past year. I have received no complaints from the dealers. From this I judge that the association is doing excellent work, and I would suggest that the work be pushed in every way imaginable, so that we dealers of the territory will have no complaints to make.

Early in the year I mailed every member of our association a personal letter, insisting on them reporting any irregularities in their localities and in this way thought perhaps the members would realize that we had an association that was doing, or trying to do, some good for the trade and that they would report something for us to work on and show those who are not members and who take no interest in the work that we would and could do something. To these letters I had one reply, but no complaints. After this I thought I would let the matter rest for a time, which I see was a mistake. Before I had time to get at the work again, much to my disappointment, I received Mr. Smith's resignation as our president, stating that his health had failed and that he was compelled to close out his business and leave the territory. At this the road began to look long and dark for association work in the territory, but after I thought the matter over and realized what a good man and organizer our first vice-president, Mr. Parkinson, was I brightened up and decided there was a greater chance for success than ever before. Mr. Smith wrote me that he had notified Mr. Parkinson of his resignation, but not hearing from Mr. Parkinson, I wrote him, advising him of Mr. Smith's resignation. He replied at once asking for a list of the members, which I furnished by return mail. With this in hand he made an effort to make up a programme for this meeting, but received no responses from the members when he asked them to take some part in the meeting. All of this has been discouraging and accounts for there being no regular programme for us to-day.

UNION WITH OKLAHOMA MERCHANTS.

Mr. Parkinson and I decided it would be a good time to get an expression from Oklahoma dealers to bring before this convention in regard to uniting the two territories in one association. Accordingly I wrote to 490 dealers in Oklahoma, inclosed self addressed postal cards for reply, and up to the time of leaving home I had received 68 replies and every one was in favor of the union, and there were five who said they expected to be present at this meeting. From the report of the Oklahoma dealers I would recommend a union of the dealers of both territories, and I would further recommend that the next convention of this body be held in Oklahoma City or some Oklahoma town that would be convenient for the dealers of both territories. I would further recommend that the date of our meetings be changed from May to January or February.

On May 1 I mailed 317 invitations, with as many circular letters, to the dealers of the Indian Territory, and in this letter I insisted on every dealer being present at this convention. I had some 12 or 13 replies from dealers, five or six of whom stated that they expected to be present.

I beg to report that we have 35 members at this time. Since our last meeting I have received a number of encouraging letters from the secretaries of both the National Hardware Dealers' Association and the National Federation of Retail Implement and Vehicle Dealers' Associations. Both seem to be doing good work and all will agree with me that the manual sent out quarterly by the National Hardware Dealers' Association is always encouraging.

We are about even on our finances. We have been to

great expense in sending our delegates to the national associations and in advertising this meeting in both territories, with only a small membership to do it with.

Thanking you for favors shown me in the past year and hoping some one will be willing to relieve me of the secretaryship for the next year, I will close my report.

Next Meeting in Oklahoma.

The question of the consolidation of the dealers of Oklahoma and Indian territories was then discussed at considerable length, some favoring the idea and others opposing it, the opposition believing it would be better for each territory to maintain its own association. A motion was finally made that the next meeting of the association be held in Oklahoma City and that an effort be made to have the dealers of Oklahoma present. The motion was carried.

Reports of Delegates.

G. W. Mowbray of Tulsa was then called upon for his report as delegate to the National Federation of Retail Implement and Vehicle Dealers' Associations. He made a verbal report. He said the association did right to join the federation, as by that means it would be able to accomplish much more in the way of correcting abuses in the trade. He urged the members to take more interest in association work, not to fail to report any irregularities in the trade and to be sure that they had cause for complaint when they did make it and to do nothing that would leave them open for criticism on the part of jobbers and manufacturers. He also urged dealers to have a better understanding with dealers in their own towns.

J. B. McAlester also made a verbal report as delegate to the National Retail Hardware Dealers' Association. He said the National Association was doing excellent work, and that many prominent manufacturers who formerly supplied catalogue houses had discontinued the practice and signed an agreement to not sell to them in the future.

A recess of ten minutes was taken, during which the Resolutions and Nominating committees prepared their reports. After recess Acting President Parkinson took the chair. E. C. Stretch of Vinita then read a paper on the subject "Selling Goods on Their Merits," which was as follows:

Selling Goods on Their Merits.

What I mean by this is to sell goods worth the money, for the quality will be remembered long after the price has been forgotten. My experience is that it is far better to tell the purchaser just what the implement will do, so he will know what to expect. It may be necessary to have some cheap goods, and even a medium grade, along with your best, but the best thing for all is to try always to sell the best. That policy will win in the long run. It may be hard; your competition may be close, but by persistent effort you will educate your trade into buying a better class of goods.

QUALITY IN BUGGIES

is especially desirable. The average purchaser has not had the experience or practical knowledge of the construction of a Buggy, and when everything is covered with paint and looks bright and fresh, the finish may often be misleading. The dealer from his point of view has a better idea of the construction and quality of the material used, and if he is anxious to build and hold a good substantial trade he cannot afford to misrepresent the job in question. In the medium priced work, there is quite a range of prices asked for practically the same grade of goods. One manufacturer will make a leather quarter Buggy for a certain price; another one with the same grade of top and a special wheel for another price. Now, the dealer may be misled in this, even to paying $10 more for the same Buggy made up by another manufacturing company. We all base our selling price largely upon what our goods have cost us, and this is in part fair. But let us study the business, and be careful when we buy, and remember that slit leather and union cloth won't wear any longer sold under one factory name plate than under another.

Many of our dealers do not realize what it is that makes the real difference in value between jobs. If any manufacturer is asking $5 or $10 more for one Buggy than for another of the same class, just compare the goods and the material used and you will readily decide whether the value is actually there or not. The dealer, in his purchase, should satisfy himself as to the material and workmanship of the factory from which he buys.

It has been my pleasure to visit the factories from which I buy my goods, and to see the work in course of construction, and there is by far the best place to judge of the merits of vehicles. As to the gear on cheap work, it will be safe to call it malleable, but on the better grade you will find a full wrought gear. When the dealer has posted himself as to the real cost of these articles, he will gladly pay the additional cost for better grades. Then, when he offers this for sale on his floor, he does not hesitate to ask a good profit, for whoever buys this job will find the quality is really there and the price, even though it seems high, will be forgotten. If the article proves good, there is never any complaint about the price.

My experience has been that it is best to sell the best grades possible—talk quality. The price should not hinder the sale if the goods are worth it. It is thus possible to build up a reputation for good goods, and the tendency is upward and onward. On the other hand, if you try to meet the low priced Buggy competition you often must sell at cost, and you have lost money besides, for the purchaser will come back frequently for repairs and you will be obliged to furnish them. Moreover, often the delay will so disappoint your customers that the next time they want to buy they will pass you by as a cheap John and will say that your work did not stand up, was not what it should have been, &c. I believe human nature is much the same all over this land. The dealer has the chance to build up and gather around him a class of customers, who, with fair treatment, will be as loyal and appreciative of his way of dealing with them as you feel toward your grocer or dry goods merchant. So, in concluding, I say always buy the best, keep the best and sell the best, for the best is none too good.

Officers for 1903.

The Nominating Committee then presented the following nominations for officers for the ensuing year: For president, E. C. Stretch of Vinita; for first vice-president, A. L. Severance of Durant; for second vice-president, G. W. Mowbray of Tulsa; for secretary-treasurer, Sam R. Frazee of Vinita; for Executive Committee, J. F. McNabb of Wewoka, W. H. Fuller and J. B. McAlester of South McAlester; Harry Bieler of Checotah, J. D. Gee of Muskogee. For delegates to National Retail Hardware Dealers' Association, S. R. Frazee and J. B. McAlester. For delegate to the National Federation of Implement Dealers, Fred Parkinson. All were unanimously elected. Mr. McAlester had said that he found nearly every association represented at the national association by two delegates, one of whom was the secretary, and that if the association would send the secretary next year and make him a delegate he would bear his own expenses.

Resolutions.

The Resolutions Committee submitted the following report:

Be it resolved, That we, the Retail Hardware, Implement and Vehicle Dealers' Association of the Indian Territory, in convention assembled, favor taking the retail dealers of Oklahoma Territory into our association and working in unison with them for the furtherance of our common interests.

Resolved, That we favor some system of monthly reports by the secretary to the members, stating what is being done in the way of adjusting grievances and furthering the interests of the association.

Resolved, That we tender a vote of thanks to our officers, and especially to our secretary, for their efficient work during the past year.

Resolved, furthermore, That we heartily thank Mr. Mowbray and Mr. McAlester, who so ably represented us at the meetings of the national associations.

Resolved, That a vote of thanks be tendered to the local dealers and to the city of South McAlester for their hospitality and hearty welcome.

Resolved, That we thank J. E. Baird, representative of the *Implement Trade Journal*, for his presence and for the interest he has shown in our association.

Report of Executive Committee.

The Executive Committee made the following report:

We, your Executive Committee, beg to report that accounts of the secretary have been examined and found correct. We also report the following firms as having made application for membership and been accepted: Kaiser & Fuller, South McAlester; Diamond Hardware Company, South McAlester; Louis Rosenbaum, Durant; H. C. Beckman & Co., Okmulgee; Parkinson & Trent Mercantile Company, Okmulgee.

The expense accounts of our delegates to national conventions show the following:

Expense of J. B. McAlester to Chicago, $50; expense of G. W. Mowbray to Minneapolis, $50. We also report that the accounts of the treasurer have been found correct and that they show a balance in the treasury of $40.

The matter of maintaining a monthly bulletin was discussed at some length, but on motion was referred to the Executive Committee to handle in whatever manner it deemed advisable.

Meeting then adjourned until 1.30 p.m.

WEDNESDAY AFTERNOON SESSION.

After the meeting was called to order J. N. McNabb read a paper on the subject of advertising for retail dealers, as follows:

How Dealers Should Advertise.

The combination that opens the door into the treasure room of success is push, perseverence and advertising. If we omit one number in a combination we can't unlock the door, so we may push like a steam engine and persevere like a bull dog, but if we don't advertise we cannot succeed in the commercial world. When we speak of advertising we are apt to think of the stereotyped newspaper ad., that is allowed to run six months without being changed and which contains the rambling statement that John Jones is still doing business at the old stand and handles hats and caps, boots and shoes, dry goods and groceries, and will be pleased to see all his old friends and patrons. The same John Jones probably has a dozen or two old tin signs on trees by the country roadside. He sits in a dingy store filled with shopworn goods and talks politics. His show windows are filled up with an assortment of Grindstones, rolled oats, Cross Cut Saws and anything else that happens to drop there. He says that advertising doesn't pay. Of course it doesn't pay him. He has yet to learn what advertising means.

IN THE STORE.

Advertising is the art of compelling people's attention to what you have to sell, and the ways of doing this are as varied as are the conditions prevailing in different localities. The successful advertiser is the one who studies these conditions and makes the best use of them. The wide awake merchant of to-day begins by advertising in his store. His salesmen are polite and attentive; his goods are fresh and clean and displayed in such an attractive manner that people stop to look at them a second time, even when they do not wish to buy. Later on when they do want to buy they come back to Mr. Wideawake.

THE SHOW WINDOW.

The connecting link between the crowd outside and the store within is the show window. Here Mr. Wideawake displays in the most attractive manner goods that are in season and does not hesitate to spend money to make a pretty window. A stranger will always pass the store with a cluttered up show window and walk two or three blocks further on looking for a nice place. The show window that is bright and attractive and always contains something new, brings in many customers, while the one that is neglected drives them away.

NEWSPAPER ADVERTISING.

Another medium of advertising that no merchant can afford to overlook is the newspaper. There is something wrong with the man who doesn't make money through newspaper advertising. Buy some electrotypes; rent a larger space and put pictures with your ads. Then specialize and change your ads. often and you will soon say it pays. Some make the mistake of trying to tell about everything they have to sell in one small three-column ad. That is wrong. Advertisements must be brief and to the point. Take up some one line that is in season and use a good, big picture; then in a few brief words strike some sledge hammer blows about the merits of the article in question. No one ever takes time to read a long, tedious advertisement.

PERSONAL TALKS.

And now, if you will pardon me for becoming personal, I will tell you of another way my firm advertises. Between seasons we send a man into the country to have personal talks with the farmers. If any one is dissatisfied, we find it out, and if possible, set matters right. We find out who are the newcomers, where they are from and what they have. We learn who is going to need a Haying Outfit, a Grain Drill or a Wagon and try to sell him. We try to make the farmer feel that we have interests in common with his, that we are his friends and neighbors, and always glad to do him a favor. Then we have a mailing list of several hundred names. We keep tab on who are our customers and about how much credit they are entitled to. We have others marked who are good, but trade elsewhere, and by going to see them and writing to them occasionally we try to win them over. Then, for our own protection, we have the hard customers marked also.

We frequently send out circulars and personal letters advertising any special deal we have to offer and soliciting trade in a general way. We spend a good deal of money in this way and consider it a good investment.

These are only a few of the many ways to advertise, and, as I have said, one must study conditions, spend some money and keep everlastingly at it to make it pay.

J. D. Gee made a short talk urging dealers to take more pains in displaying goods and in keeping them clean and attractive.

H. C. Beckman of Okmulgee stated that, he having declined to accept the agency for a certain gasoline engine on the terms of the manufacturers, they had sold one direct to user in his town and he was at a loss to know whether he had ground for complaint against the company. This precipitated a lively discussion, as it developed that other dealers present had had difficulty with the same company in many instances where there was no question about grounds for complaint.

The meeting then adjourned to accept the invitation of the local dealers for a drive over the city and to the mining camps in the vicinity.

A short session was held in the evening, after which the visitors adjourned to McFarland's dining hall, where a supper had been prepared and an enjoyable time was had until late at night.

The Turner Hardware Company kept the convention supplied with cigars and also distributed handsome souvenirs.

The following travelers were in attendance: O. S. Webb of the Studebaker Bros. Mfg. Company, G. W. Griswold of the Majestic Mfg. Company, E. C. Jacobey of Fairbanks, Morse & Co., John Bradford of the Turner Hardware Company, W. W. Franks of the Standard Varnish Works and P. D. Watson of the Speer Hardware Company.

RICHARDS & CONOVER HARDWARE COMPANY.

RICHARDS & CONOVER HARDWARE COMPANY, Kansas City, Mo., are now comfortably settled in their new salesroom and warehouses, which have a floor space of 6 acres. Their loading dock accommodates eight teams and all orders will be loaded from this dock, thereby insuring prompt and complete shipments. The necessity for larger quarters to take care of the company's steadily increasing business has been apparent for several years, and with the new large and conveniently arranged establishment they are in splendid position to look after the wants of their customers.

THE WESTERN SUPPLY COMPANY, Chicago, have established a branch office at Oshkosh, Wis., where they have leased a building 20 x 120 feet. J. S. Greeny, formerly with the J. I. Case Threshing Machine Company, will represent the company at Oshkosh.

SIMMONS HARDWARE COMPANY'S LABOR DIFFICULTIES

AS we go to press we are in receipt of the following dispatch from Simmons Hardware Company, St. Louis, relative to the strike which prevails among some of their employees:

In regard to the labor trouble we have had here recently, and in which we are still involved to some extent, would say some of our elevator men and freight handlers joined a union affiliated with the railroad freight handlers, and included in the American Federation of Labor. They made what seemed to us, and what has been acknowledged since by practically every one, including several labor leaders who have taken an interest in the matter, a demand absolutely unreasonable and impracticable, and one which would if granted involve practically the closing up of this business, because it would result in an increase of expenses which would overcome the very small margin upon which this business is transacted.

A strike followed our declining the proposition and our declining to treat with the union as such. The freight handlers in Cupples Station and in the other railroad freight stations of the city struck in sympathy, and our teamsters declined to haul our goods, although most of them were members of the union which was under contract not to go out in sympathy for two years. This action tied up the shipment of our goods for a few days, and has since interfered with it to some extent.

We have most of our salesmen who are nearby and have instructed the others to concentrate their efforts on future business, taking no orders for immediate shipment from stock. This has reduced the volume of our business to such an extent as to make it necessary for us to lay off a portion of our employees, and by doing so break a record of nearly 50 years, during which time we have never laid off or discharged an employee except for good cause, it having always been our custom in hard times to keep our people as long as they were faithful and satisfactory in their service, preferring to adopt that method as an evidence of appreciation of a good record. The force that we have retained is keeping well up with the orders which we are receiving by mail from our local friends and which cover their immediate wants. We have about freed ourselves from the congestion in which we were last week, with the result that we are now shipping in fair volume and quite promptly. We have not as yet attempted to solicit any business through the usual channel, but are taking good care of the immediate wants of our friends who have been regular patrons in the past and have looked to us to supply them for many years.

During the ten days since the strike we have made several efforts to bring about arbitration and conciliation on most broad lines, to the liberality of which no exception has been taken. In one case where the arbitration was arranged for the representatives of our former employees they neither met the appointment nor made any explanation until two days later. In the other cases they declined to accept the first principle of arbitration or show their good faith, and finally, when their committee and ours agreed on a plan as being mutually satisfactory and each member of their committee personally committed himself to that plan and agreed to recommend it to his union, the union voted it down unanimously, notwithstanding the fact that the plan originated with their own arbitrator and their representatives were universally in favor of it.

We believe we have exhausted all possible avenues of considerate and peaceable means of settlemnt, and that belief is concurred in by several leaders of other unions who have offered their services for the purposes of conciliation, and who have, after the matter has been explained to them, freely stated that they agreed with us as to our having done all that could have been done and as having been fair, broad and liberal. From present indications we will be running the usual way by the end of this week and be in position to serve all of our patrons, giving them very prompt and satisfactory service, which our unrivaled shipping facilities place us in position to furnish.

SIMMONS HARDWARE COMPANY,
W. D. SIMMONS, President.

PRICE-LISTS, CIRCULARS, &c.

THE BEAN SPRAY PUMP COMPANY, San José, Cal.: Bean Spray Pumps and Nozzles. Catalogue No. 10 illustrates Power Spraying Outfits, Hand Spraying Pumps, Spray and Whitewash Pumps, Bucket and Tank Pumps, Nozzles, &c. The Bean-Chamberlin Mfg. Company of Hudson, Mich., are also manufacturers of these goods and supply Eastern territory.

IRVING D. BOOTH, Elmira, N. Y.: Illustrated catalogue devoted to Iron, Steel, Pipe, Tin Plates, Nails, Window Glass and Heavy Hardware.

THE ECLIPSE REFRIGERATOR WORKS, Burlington, Vt.: Catalogue devoted to Eclipse Cleanable Refrigerators, including Domestic Refrigerators, with and without Water Coolers, Grocers' Refrigerators, Ice Chests, &c. It is explained that these goods have a positive circulation of dry air by means of removable flues, and introducing cold air at the bottom of the provision chamber.

THE KERR BROS. MFG. COMPANY, Toledo, Ohio: Illustrated price-list relating to Handles, Tools, Hard and Soft Wood Lumber, Electrical Supplies, Tent Materials, &c. Attention is directed to the Crary Coupler, an attachment for wind mills, and to the Eureka Bag Holder. The company have added to their line Linemen's Construction Tools and Electrical Supplies.

THE FORSYTH MFG. COMPANY, Buffalo, N. Y.: Illustrated catalogue and price-list devoted to the Forsyth Coaster Brake, Bicycle Supplies and Specialties.

MORLEY BROTHERS, Saginaw, Mich.: Illustrated descriptive catalogue of the Morley Easy Rolling Shelf Ladder and testimonials from users of the Ladder. Also catalogue illustrating the firm's Blue Line Lumbering Tools.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses:*

FROM R. M. SKINNER & Co., Rogers, Texas., who have lately lost considerable of their stock by fire.

FROM HATCH & HENDERSON, who have recently removed their Hardware, Stove and Farming Implement business from Kiel, O. T., to Paden, I. T., a new town on the Fort Smith & Western Railroad, 35 miles northwest of Shawnee.

FROM THE HIBBS HARDWARE COMPANY, Portsmouth, Ohio, who were incorporated on May 2, the incorporators being J. M. Graham, John C. Bauer, W. K. Dupre, C. L. Storck, A. S. Duduit, B. W. Hopkins, and the capital $50,000. This corporation takes over the business of the J. C. Hibbs Hardware Company, wholesale and retail Hardware, and Storck, Hopkins & Co., wholesale and retail Stoves and Tinware. They will continue as jobbers and retailers of Shelf and Heavy Hardware, Agricultural Implements, Paints, Sporting Goods, Stoves, Tinware and kindred lines, and will occupy the former Hibbs quarters. The officers of the new company are: Benjamin W. Hopkins, president and general manager; Charles L. Storck, vice-president; A. S. Duduit, secretary and treasurer.

AN agreement has been signed by the Chicago Iron and Heavy Hardware houses and their employees, whereby the latter are given the following increased scale of wages: Clerks who have been receiving $9 will now be paid $13.50; wages of those receiving $12 have been advanced to $15, and those who have been paid $15 will receive $18. No discrimination is to be made against old men. Those who are said to have agreed to pay the new scale are S. D. Kimbark & Co., Kelly, Maus & Co., Thompson, Hoff & Co., E. D. Kimball Company, Jones & Laughlin Company, Scully Steel & Iron Company and Joseph T. Ryerson & Son. About 600 employees are benefited.

AMONG THE HARDWARE TRADE.

Andrew R. Govan, R. E. Chew, Jr., and M. E. West have purchased the business of Pillow & Moore, dealers in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c., Helena, Ark., and will continue under the style of Arkansas & Mississippi Hardware Company. They will do a wholesale as well as retail business in the above lines.

Stump Bros. have sold their Hardware stock at Ligonier, Ind., to Straus Bros. & Co.

S. E. Kemp has sold his Hardware, Stove, Agricultural Implements and Machinery, Wagon and Buggy and Furniture business in Mooreland, O. T., to Crane & Stout, who will continue at the old stand, which will be materially enlarged.

A. G. Brooks & Son Hardware Company, Green Bay, Wis., have been incorporated, with a capital stock of $15,000, to carry on the wholesale and retail business in Shelf Hardware, Stoves, Tinware, Agricultural Implements and Sporting Goods.

Moorhead Hardware Company, Moorhead, Minn., have been incorporated, with a capital stock of $25,000, by Emmett C. Hazen of Chicago and Henry L. Babst and Eric W. Hansen of Moorhead. The company's lines include Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Paints, &c. Their store is 50 x 75 feet in dimensions.

A. J. Arnold has lately engaged in business in Hinton, O. T., handling Shelf Hardware, Farming Implements and Stoves.

Frank T. Clark Company, Limited, successors to Cooke, Clark & Co., Norfolk, Va., have removed their business to their new store and warehouse, 96 and 98 Brooke avenue and 95 and 97 Tazewell street, where they have largely increased facilities. The building is five stories high and has a floor space of about 25,000 square feet. It is modern and up to date in every particular. The company are doing both a wholesale and retail trade. On the second floor of the building they have fitted up very elaborate showrooms for the display of Mantels, Tiles, Brass and Wrought Fire Place Goods, Gas and Electric Lighting Fixtures, and Artistic Builders' Hardware. One of their specialties will be Glass, embracing Window Glass, Polished Plate Glass, Wire Glass, Ribbed Glass, Ornamental and Fancy Glass of every description, French, German and American Mirror Plates, &c.

Waldron Hardware Company, Waldron, Ark., have been incorporated with a capital stock of $20,000, and will conduct the wholesale and retail business in Hardware, Mill Supplies, Machinery, &c.

Drake-Bahney Hardware Company are successors to A. M. Drake & Son in the wholesale and retail Hardware, Stove, Tinware and Sporting Goods business in Carthage, Mo.

The Swank Hardware Company, Johnstown, Pa., have been incorporated with a capital of $250,000, and several employees who have been with the concern for a number of years, and have reached positions of trust and responsibility, have been taken into the membership. The business of the company was established in 1862 by the late Jacob Swank, who lost his life in the appalling Johnstown flood in 1889, when the entire building was washed away. The company now occupy a fine modern five-story building, equipped with all the latest facilities for the conduct of its large and steadily expanding business. They have on their payroll 42 persons, including three traveling salesmen who, in the interest of their jobbing department, cover all of Cambria and Somerset counties, major portions of Indiana, Westmoreland and Clearfield counties, as well as parts of Maryland. The jobbing department is one which it took considerable time and patience to establish on a firm basis on account of the severe competition of jobbing houses in larger cities, but by careful attention and courteous treatment of customers, the trade has enlarged from the necessity of one traveling man a few years ago to three at the present time.

MISCELLANEOUS NOTE.

The T & B Fruit Jar Holder.

The Forbes Chocolate Company, 229-233 Sheriff street, Cleveland, Ohio, have secured possession of the patents on the T & B fruit jar holder, which they are now putting on the market. The holder is adopted to operate upon jars of different sizes with the same efficiency. The device is so constructed that the working of the encircling band is in no way dependent upon the moving of the handle.

Children's Vehicles.

The accompanying cuts relate to new vehicles offered by the Toledo Metal Wheel Company, Toledo, Ohio. Automobiles are made in 11 numbers with bodies of different sizes, finished black and olive green, corduroy upholstered; steel and rubber tired wheels, painted or tinned; with plain and ball bearings. The 999 express locomotive is 34½ inches high, 21¾ inches wide and 46 inches long, with front wheels 12 inches and rear wheels 18 inches in diameter. The body is finished in black enamel with gold bronze stripes. The cab is painted vermillion and nicely decorated. The wheels are tinned and are furnished with steel and rubber tires. The health propeller is designed to develop the chest and arms of children, and is referred to as running very easily. It is made with different diameter wheels, steel and rubber tires, plain and ball bearings. The frame can be extended 5 inches. The propeller has dark green enamel on frame, the seat is black enamel with frame and seat striped, and is upholstered in dark green corduroy.

Fig. 1.—The Toledo Automobile.

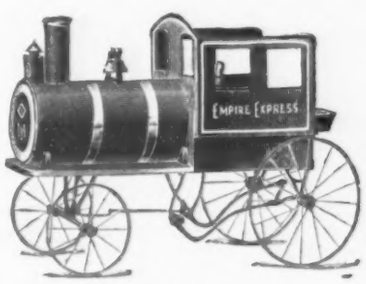


Fig. 2.—The Empire Express Locomotive.

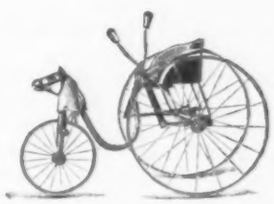
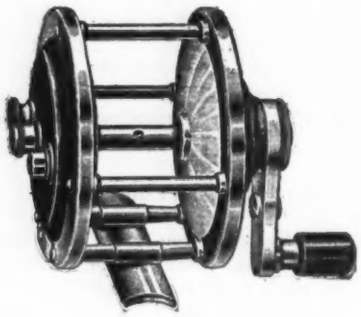


Fig. 3.—The Favorite Health Propeller.

The Liberty Free Reel.

The Liberty Bell Company, Bristol, Conn., are putting on the market the reel shown herewith. It is explained that the winding is positive because the gear wheels are at all times connected, and not subject to excessive strain or undue wear. To free the spool the handle is turned backward or the knob is twisted forward between the thumb and fingers. After the line is run out the click can be thrown into action and it will operate only while the line is running out in playing the fish, thus preventing unnecessary wear of the click and wheel, and what is more important, it is remarked, pre-



The Liberty Free Reel.

venting any drag in winding in, so that the actual amount of resistance is determined. The adjustable click is referred to as an important feature, for by turning the tension knob the resistance of the click can be increased or diminished, and when once set requires no more attention for the day or season unless changes are required for different kinds of fishing. The drag is applied by the handle and in order to prevent any slack line in playing the fish, the handle is pressed toward the reel at the time the spool is free and the amount of drag is regulated by the amount of such pressure. With this force of drag, it is pointed out, it is not at any time necessary to let go of the knob either to thumb the line or for any other purpose until the fish is landed. In Fig. 2 the cut at the left shows the position of the parts

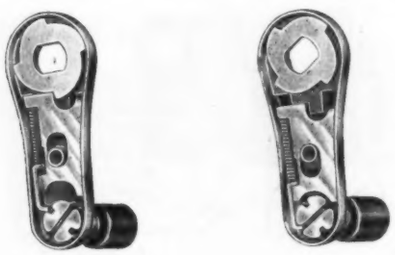


Fig. 2.—Position of Parts Inside Handle.

inside the handle while winding in the line; the one to the right showing the position when the spool is running free. The reel is easily taken apart without the aid of tools for cleaning and oiling, and if desired, in the case of a broken line, another spool with line can be quickly inserted, thus saving valuable time, if such an accident should happen while the fishing is lively.

Hodell Rubber Pump Bucket.

The Cleveland Galvanizing Works, Cooper and Clifton streets, Cleveland, Ohio, are offering the new rubber pump bucket shown herewith. Attention is directed to the absence of a cast iron link and to the lifting surface of the rubber as being at right angles to the column of water. This position of the rubber is referred to as not only producing a perfect fit between the wearing edge and the walls of the tubing, but as enabling the manufacturers to economize in the amount of rubber used, so that they are able to furnish an unusually good quality. It is pointed out that the fanciful shapes and forms in some buckets are a waste of material, as the only part of the rubber which is of any service is that which comes in contact with the tubing. The bucket described, it is remarked, uses a minimum amount of rubber and has its beveled edge so arranged that it will take up any wear automatically, thereby lengthening its life considerably. The link is made of wire a gauge heavier than pump chain and the ends are automatically locked beneath the

Hodell Rubber Pump Bucket.

steel washers, thus being stronger than the chain of which it is destined to become a link. It is stated that the rubber used is especially compounded for the bucket, while the washer and links are all galvanized after forming.

The MacDougall Automatic Revolving Clothes Drier.

F. Stuart MacDougall of Worcester, Mass., is offering the new clothes drier shown herewith. The device is one of the type known as wall driers, and is constructed to make its use possible anywhere that it may be hung, in or out of doors, and in a corner, if desired. It is not in-

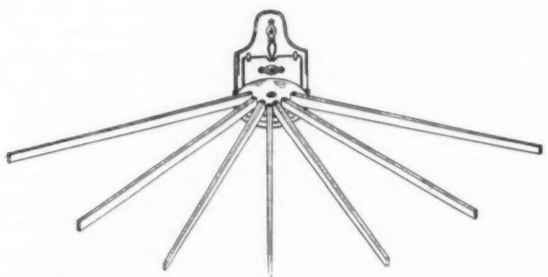


Fig. 1.—The MacDougall Automatic Revolving Clothes Drier.

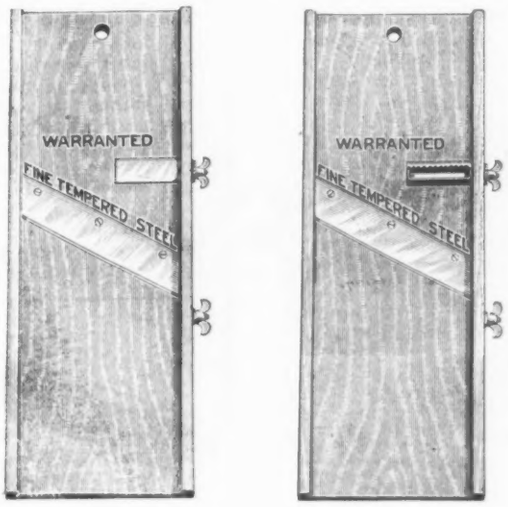
tended to be nailed or screwed permanently in place. In the top board are two plates, each having a pear shaped hole, which pass over sustaining nails or screws or hooks, the shape of the hole preventing the drier tipping up in case of weight being applied at one side. The lower board, which holds the turntable operating the arms of the drier is hinged to the top board by means of screws on the side. Two hooks on the lower board lock into wire catches on the top board, when the arms are raised to be at right angles to the top board. The locking is accomplished automatically by means of a spring at the back of the

Fig. 2.—The MacDougall Clothes Drier Flat Against the Wall.

top board. A touch of a spring at either side releases the lower board and it falls with the arms flat against the wall, as shown in Fig. 2. The arms of the drier are fastened to the turntable by means of screws, loose enough to permit of the moving of the arms in any direction. The turntable is secured to the lower board by means of a central screw, upon which it revolves. A lock under the turntable secures it in any of five positions.

Slaw Cutter and Corn Grater Combined.

J. W. Mast Mfg. Company, Lititz, Pa., are offering the combined slaw cutter and corn grater shown herewith. This combines two efficient utensils in one, occupying



Slaw Cutter and Corn Grater Combined.

only the space required for one and costing but little more than a slaw cutter without the corn grater attachment. The manufacturers state that seasoned hard wood is used, and that the knives and graters are made of fine tempered steel.

Gifford's Galvanized Steel Plate Snow Shovel.

The accompanying illustration represents a new feature in snow shovels offered by the Neverslip Tin Cover Company, Watertown, N. Y. The special advantages claimed by the makers are a galvanized steel blade with W-shaped ribs or grooves running parallel to the handle,

Gifford's Galvanized Steel Plate Snow Shovel.

strengthening the blade, while also preventing the snow sliding sideways. It is remarked that the blade will not rust, shrink or swell, check or split. The blade also has a combination spring steel point, with folding sockets at each end, securely riveted. The shovel has an adjustable lifting handle, which can be raised or lowered at will, making it adaptable to every condition for light, heavy or deep snow, also for tall or short people. The blade is 22 inches wide at the bottom, 18 inches at the top and 15 inches high, the shovel weighing 5 pounds. The manufacturers claim that the shovel will last a long time.

Havana Shop Trucks.

The Havana Metal Wheel Company, Havana, Ill., have recently put on the market the shop trucks shown in the accompanying cuts. The all steel truck for use in smith and forge shops, shown in Fig. 1, weighs 200 pounds. The length between standards is 3 feet 4 inches, the width over all is 19 inches and hight from floor to top of platform 15½ inches. The front wheels are 12 inches and rear wheels 14 inches in diameter, with 2-inch tread. The capacity of the truck is 3000 pounds. The tongue is made to lift out if desired, which is referred to as

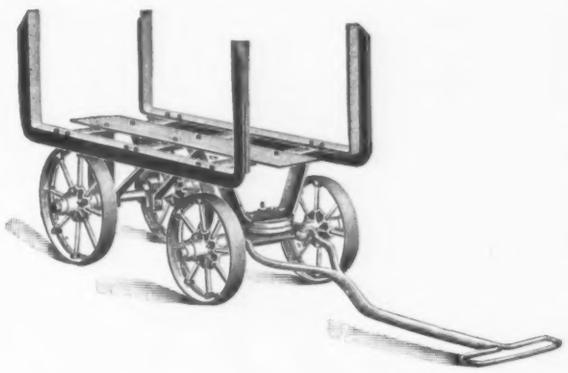


Fig. 1.—Smith and Forge Shop Truck.

a convenient feature when a number of trucks are handled in a small space. Specifications as to length and width of truck may be changed to suit requirements. The capacity of the truck illustrated in Fig. 2 is 4000 pounds. It is referred to as very strong and capable of handling heavy loads. The platform is 2½ x 4½ feet, 1½ inches thick. The hight from the floor to the top of the platform is 18 inches. The front wheels are 12 and the rear

Fig. 2.—Platform Warehouse Truck.

wheels 14 inches in diameter, with 2-inch tread, weight of truck being 245 pounds. Almost any style of platform or box, it is explained, may be mounted on this gear. The tongue can be changed from one truck to another if desired.

The business of Warren H. Willard & Co., Hardware dealers, Worcester, Mass., has been incorporated under the laws of Massachusetts as the Warren H. Willard Company, with a capital stock of $15,000. The officers are Warren H. Willard, president and treasurer; Harry A. Willard, clerk, and these officers and Charles T. Willard constitute the board of directors. The business is an old one, having been founded by E. M. Wood & Co., who were succeeded by Warren H. Willard & Co. in 1884.

The Takitezy Automatic Lawn Sprinkler.

The Takitezy Lawn Sprinkler Company, 606 Adrian avenue, Jackson, Mich., are offering the Takitezy sprinkler shown herewith. It is adjustable to different areas, and will make a complete revolution or describe any part of a circle according to the operator's desire or the requirements of the grounds. Letters A show the reversing pins, which may be placed in various positions, thereby changing the direction and scope of the spray. By placing the reversing pins 3 inches apart, it is explained that the nozzle will sprinkle a space only 6 feet wide, and that when the pins are removed the nozzle will make a complete revolution and sprinkle evenly a space 70 feet in diameter. Letter B shows the adjusting point where the nozzle may be tilted up or down, thus regulating the distance of the stream from 10 to 35 feet. It is pointed

The Takitezy Automatic Lawn Sprinkler.

out that the sprinkler permits the passage of a full size stream through the nozzle; that it sprays the entire distance from the sprinkler to the point at which the main stream strikes the ground; that it is approachable while in operation to adjust or move without passing within the spray; that the sprinkler is not affected by any foreign substance in the water, and that it will give satisfaction under any conditions.

Children's Safety Coaster.

The accompanying cut represents a coaster which, it is remarked, will roll on paved streets which have only a slight grade, while on hilly streets it will rival a sled in speed, being under perfect control at all times, and readily guided around obstacles or into side streets by means of the foot guide. It is explained that the coaster can

Children's Safety Coaster.

be stopped anywhere almost instantly by a slight pressure on the hand brake, which acts on both rear wheels. The coaster is made in three sizes, and is offered by the Gravity Coaster Mfg. Company, Homestead, Pa.

The Universal Dial Test Indicator No. 196.

The L. S. Starrett Company, Athol, Mass., are putting on the market the dial test indicator shown in Fig. 1. It is referred to as being simple, easily read and very sensitive, and is described as follows: The slightest pres-

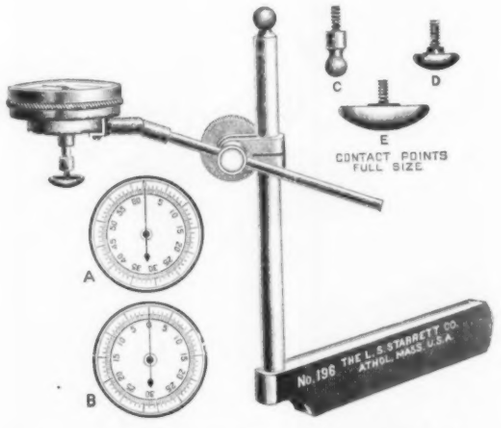


Fig. 1.—Universal Dial Test Indicator No. 196.

sure upon the contact point produces a movement of the hand on the dial. The circumference of the dial is divided into 125 equal spaces, each one representing a movement of the contact point of one-half thousandth of an inch. One revolution of the hand therefore indicates 1-16 inch, and two revolutions ⅛ inch, which is the capacity of the instrument. The dials are figured in two different ways: Style A is marked 0, 5, 10, 15, &c, to 62½, the figures denoting thousandths, and is most useful in the greater forward movement, measuring, indexing, spacing, &c.; style B is marked from 0 to 31¼ to right and left, and is best for general use. By bringing the contact point against the work just enough pressure to give the hand one full turn, then setting it at 0, an opportunity is given for one full revolution of the hand to both right and left of 0, showing a rise or drop in the work and the amount of the variation. A valuable feature is the ad-

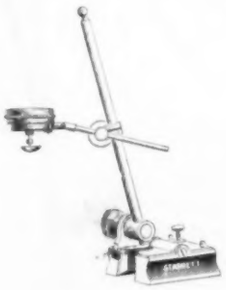


Fig. 2.—Special Tool Post.

justable dial. By turning the knurled rim the dial may be instantly moved to bring the 0 mark to any point desired in relation to the hand. Each indicator is fitted with friction joint and removable 3-inch rod, adapting it for use in any position, at the top, bottom or side of the work; also with three hardened and ground contact points adapted for different classes of work. There is also a safety collar to prevent damage from an upward jam or crowding, and a small, hardened screw connecting the collar and contact point, with a V groove in the center. This little screw is strong enough to stand all the pressure necessary, but is intended to break under too much strain or side jam, and so prevent greater injury to the instrument. The broken ends are easily removed, and a new screw inserted. The special tool post and sleeve, as shown in Fig. 2, are useful in lathe work. For general work the indicator is adapted for use with the company's 9-inch or 12-inch surface gauges. On lathe, planer, milling machine and in setting up machinery, it is remarked that this tool will be found indispensable when once used.

Current Hardware Prices.

REVISED MAY 26, 1903.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued April, 1902, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Abrasives—

Adamite in Carloads:
Crystal ₩ ton $90@100
Grain ₩ ton $120@140
See also *Emery*.

Adjusters, Blind—

Domestic, ₩ doz. $3.00 33⅓%
North's 10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent 25&5%
Tapliu's Perfection 25&5%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Armand Hammer, Wrought ₩ lb 8¼@8¾¢
Hael Patent Trenton ₩ lb 9½@9¾¢
Eagle Anvils ₩ lb 7¼@7¾¢
Hay-Budden, Wrought 9@9¼¢
Horseshoe brand, Wrought 9@9¼¢

Imported—

Peter Wright & Sons ₩ lb 10¼¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00 50&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz. 25%
Smaller Lots. 20%
Lots of 3 doz. 30%

Augers and Bits—

Com. Double Spur 70@70&10
Boring Machine Augers 66⅔@70%
Car Bits, 12-in. twist 60@60&10%
Jennings' Pattern
Auger Bits 50&10&5@60%
Ford's Auger and Car Bits 40%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list 25&10%
No. 30. R. Jennings' List. 40&7½&10%
Russell Jennings 25&10&2½%
L'Hommedieu Car Bits 15&10%
Mayhew's Countersink Bits 45%
Millers' Falls 50&10&7½%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 50&10%
Snell's Car Bits, 12-in. twist 60%
Wright's Jennings Bits (R. Jennings' list) 50%

Bit Stock Drills—

Standard List 65&5@70%

Expansive Bits—

Clark's small, $15; large, $26 50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18 50&10%
C. E. Jennings & Co., Steer's Pat. 25&10%
Swan's 60%

Gimlet Bits—

Common Double Cut..gro. $2.50@3.00
German Pattern.....gro. $4.00@4.25

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames 25&10%
New Patent 25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—

Ford's 40%
Snell's 40%
C. E. Jennings & Co.:
L'Hommedieu's 15&10%
Watrous' 33⅓&10%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled gro. $2.75@3.00
Unhandled, Shouldered. gro. 63@66c
Unhandled, Patent.....gro. 66@70¢
Peg Awls:
Unhandled, Patent....gro. 31@34¢
Unhandled, Shouldered. gro. 65@70¢
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, factory brands... $6.00
First Quality, jobbers' brands... $5.5
Second Quality $5.00@5.25

Axle Grease—See *Grease, Axle.*

Axles—

Iron or Steel

Concord, Loose Collar.... 4½@5c
Concord, Solid Collar.... 5½@5½c
No. 1 Common 3¾@4 c
No. 1 ; Com., New Style..3¾@4 c
No. 2. Solid Collar 4¼@4½c
Nos. 11 to 14 60¢10¢10¢70%
Nos. 15 to 18 ¢
Nos. 19 to 22 70&10¢5%

2% cash 10 days.

Boxes, Axle—

Common and Concord, not turned..
lb. 4¾@4½c
Common and Concord, turned..
lb. 5@5¼c
Half Patent lb. 9@9½c

Balances— Sash—

Caldwell new list 50%
Pullman's 60%

Spring—

Spring Balances 50&10@60%
Chatillon's:
Light Spg. Balances. 40&10%
Straight Balances. 40%
Circular Balances 50%
Large Dial 30%
Peiouze 50%

Barb Wire—See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lbs., per lb 3@3¼c

Towel—

No. 10 Ideal, Nickel Plate ₩ gro. $8.50
No. 20 Ideal, Brass Finish ₩ gro. $8.50

Baskets—

Hoffman's Brick Baskets each $3.25

Beams, Scale—

Scale Beams, List Jan. 12, '85 40&10%
Chatillon's No. 1 30%
Chatillon's No. 2 40%

Beaters— Egg—

Lightning Chain, ₩ doz, $1.15; ₩ gro.
$12.00
National Mfg. Co.: ₩ gro.
No. 1 Dover, Family size $7.00
No. 2 Dover, Hotel size 14.00
Taplin Mfg. Co.: ₩ gro.
No. 60 Improved Dover $6.50
No. 75 Improved Dover $7.50
No. 75-2 Imp'd Dover, Tin'd 9.00
No. 100 Improved Dover 8.00
No. 102 Improved Dover, Tin'd 9.50
No. 150 Improved Dover, Hotel, $15 00
No. 152 Imp'd Dover, Hotel, Tin'd 17.00
No. 200 Imp'd Dover Tumbler 12.00
No. 202 Imp'd Dover Tumbler Tin'd 13.00
No. 300, Imp'd Dover Mammoth, ₩ doz. $7.00
Wonder (S. S. & Co.) ₩ gro. $6.00

Bellows—

Blacksmith, Standard List. 70@70&10%

Blacksmiths'—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each..	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:
Each..$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch.....	*9*	*10*	*11*	*12*	*13*
Doz.....	*$8.00*	*9.50*	*10.90*	*12.80*	*14.25*

Hand—

Inch.....	*6*	*7*	*8*	*9*	*10*
Doz.....	*$4.75*	*5.70*	*6.60*	*7.60*	*8.50*

Net Prices.

Bells— Cow—

Ordinary goods 75&5@75&10%
High grade. 70@70&10%
Jersey 75&10%
Texas Star 50%

Door—

Abbe's Gong 45%
Barton Gong 55%
Home, R. & E. Mfg. Co.'s 55&10%
Lever and Pull, Sargent's 60&10&10%
Yankee Gong 55%

Hand—

Hand Bells, Polished 60&5@60&10%
White Metal 55@55&10%
Nickel Plated 50@50&5%
Swiss 60@60&10%
Cone's Globe Hand Bells 33⅓@33⅓&10%
Silver Chime 33⅓@33⅓&10%

Miscellaneous—

Farm Bells lb. 2@2½c
Steel Alloy Church and School 6 %
American Tube & Stamp'g Co. Gongs 70%
Trip Gong Bells 55&10@60%

Belting— Rubber—

Agricultural (Low Grade). 75&10@80%
Common Standard 75@75&10%
Standard 70@70&10%
Extra 60&10&5%
High Grade 55&10@50&10&5%
Boston Belting Co.:
Seamless Stitched Imperial 45&5%
Boston 50&5%
Niagara 60&5%

Leather—

Extra Heavy, Short Lap....60@60&5%
Regular Short Lap 60&10@60&10&10%
Standard 70@70&5%
Light Standard 70&10%
Cut Leather Lacing 60&10%
Leather Lacing Sides, per sq. ft. 18c

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25. No. 5, $20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—
See *Augers and Bits.*

Blocks— Tackle—

Common Wooden 70&10@75%
Hollow Steel Blocks, with Ford's Patent Sheaves 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron 50&10%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c. 30&10@40%

Bolts—
Carriage, Machine &c.—

Common, list Feb. 1, '02...60&10@...%
Norway Iron, $3.00, list Jan. 1, '98 80@50&5%
Phila. Eagle, $3.00 list May 24, '99.... 80@80&5%
Bolt Ends, list Feb. 14, '95...65&5@...%
Machine, list Oct. 1, '99 65@...%
Machine with C & T. Nuts 60@2½@...%

NOTE.—*Jobbers are in many cases underselling the manufacturers.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.26*	*.30*	*.39*	*.41*	*.65*

Cast Iron Spring Foot:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.57*	*.80*	*1.00*

Wrought Barrel Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.44*	*.50*	*.61*	*.70*	*1.25*

Wrought Barrel...75&10@75&10&10%
Wrought "Bronzed. 50&5@50&10%
Wrought Flush, B. K..50&10@60&10%
Wrought Shutter...40&10&10@60&5%
Wrought Square Neck.....50@50&10%
Wrought Sunk 50@50&10%
Ives' Patent Door 60%

Stove and Plow—

Plow ...60@6...%
Stove 30@30&10%

Tire—

Common ...72½@72½&10%
Norway Iron ...30@30&5%
American Screw Company:
Norway Phila., list Oct. 16, '94 80%
Eagle Phila., list Oct. 16, '94 82½%
Bay State, list Dec. 28, '99 72½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 80%
Eagle Phila., list Oct. 16, '84 82½%
Eclipse, list Dec. 28, '99 72½%
Russell, Burdsall & Ward Bolt & Nut Co.
Empire, list Dec. 28, '99 72½%
Norway Phila., list Oct. '84 80%
Upson Nut Co.:
Tire Bolts 72½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz..	*$4.30*	*5.00*	*5.75*	*7.25*
Inch	*2¼*		*2½*	
Per Doz.....	*$8.65*		*11.50*	

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each 25%

Boxes, Mitre—

C. E. Jennings & Co. 25&10%
Langdon 15&10%
Schatz 40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American..$1.15@1.25
Barber's 50&10&10@60&10%
Fray's Genuine Spofford's ...,60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 60%
C. E. Jennings & Co. 50&5&10%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Patent. 50%
Millers Falls Drill Braces 25&10%
P., S. & W. Co. Peck's Patent 60&10&65%

Brackets—

Wrought Steel 75¢10@80%
Bradley's Wire Shelf:
Full cases 80&10&10%
Broken cases 80&10%
Griffin's Pressed Steel 80%
Griffin's Folding Brackets 70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co. 75@75&10%

Buckets, Well and Fire—

See *Pails*

Bucks Saw—

Hoosier ₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts— Brass—

Wrought list Sept., '96.....30@30&5%
Cast Brass, Tiebout's 50%

Cast Iron—

Fast Joint, Broad 50@50&10%
Fast Joint, Narrow 50@50&10%
Loose Joint 70&5@70&10%
Loose Pin 70&5@70&10%
Mayer's Hinges 70&5@70&10%
Parliament Butts 70&5@70&10%

Wrought Steel—

Table and Back Flaps 75%
Narrow and Broad 75%
Inside Blind 75&10%
Loose Pin 75&10%
Loose Pin, Ball and Steeple Tip 60%
Japanned, Ball Tip Butts. 70&10%
Bronzed Wrt. Nar. and Inside Blind Butts 55&10%

Extra 10@10&10%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series 40&10%
Hendryx Bronze:
700, 800 series 40&10%
Hendryx Enameled 40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong per lb. 4@4¼c
Sharp, 1 prong per lb. 4¼@4½c
Perkins' Blunt Toe ₩ lb 3½¢
Perkins' Sharp Toe ₩ lb 4 ¢

Cannons—

Breech Loading, 32 cal. Cartridge, Toy Cannons per doz. $2.00

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 50	2.00	2.25	each.
Iowa Pattern...	....	2.35	2.50	each.
	20	30	40	qts.
New York Patt'rn	1.65	2.40	2.75	each.
Baltimore Patt'rn	....	1.80	2.00	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	120.00 gro

Caps—Percussion—

Eley's E. B......60c
G. D.....*per M* $2@3½c
F. L.....*per M* 42@...c
G. E.....*per M* 47@50c
Musket.....*per M* 62@...c

Primers—

Berdan Primers, $1.00 per M.....5%
B. L Caps (Startevant Shells) $1.00 per M.....5%
All other primers per M. $1.22@$1.27

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10c&5%
38 C. F., $7.00.....10c&5%
22 cal. Rim, $1.50.....10c&5%
32 cal. Rim, $2.25.....10c&5%
B. B. Caps, Con. Ball Swgd.....$1.00
B. B. Caps, Round Ball.....$1.50
Central Fire.....25%
Target and Sporting Rifle.....15c&5%
Primed Shells and Bullets.....15c&10%
Rim Fire Sporting.....50%
Rim Fire, Military.....15c&5%

Cases, Show—

Sun, No. 102, Silent Salesman, 6 ft., $25.00

Casters—

Bed.....70@70c&10%
Plate.....60@60c&5%
Philadelphia.....75@75c&10%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phœnix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Jobbers' Shipments:

3-16	¼	5-16	⅜	7-16	½	9-16
8.50	6.70	4.50	4.00	3.50	3.70	3.65
⅝	¾	⅞	1 to 1¼ inch.			
3.60	3.55	3.50	3.40	per 100 lb.		

German Coil.....60c&10c&10%

Halters and Ties—

Halter Chains.....60c&10c@60c&10c&10%
German Halter Chains, list July 24, '97.....60c&10c&10@70c&10c&10%
Cow Ties.....70c&10c@70c&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$27.00
6½—6-2, Straight, with ring...$28.00
6½—8-2, Straight, with ring...$33.00
6½—10-2, Straight, with ring...$37.00
Add 2c per pair for Hooks.
Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains...60@60c&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60c&10@60c&10c&10%
Brass.....60c&10@60c&10c&10%
Safety Chain.....70c&10@75c&5%
Gal. Pump Chain.....lb. 4¼@4½c
Covert Mfg. Co.
Breast.....40&2%
Halter.....40&2%
Heel.....40&2%
Rein.....40&2%
Stallion.....40&2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters.....40@45&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter.....45@50&5%
Niagara Coil and Halters.....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Wire Dog Chains.....45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 40@45c
Carpenters', Red.....gro. 35@40c
Carpenters', White.....gro. 30@35c
See also Crayons.

Checks, Door—

Bardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60%

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc., Chests, with Tools.....30%
Machinists' and Tool Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....70@70c&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70%
L. & I. J. White.....30&30&5%

Tanged—

Tanged Firmers.....40c&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181.....16⅔&10%
L. & I. J. White, Tanged.....25&5%

Cold—

Cold Chisels, good quality.lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary.....*lb. 8@9c*

Chucks—

Beach Pat., each $8.00.....35&5%
Pratt's Positive Drive.....25%
Empire.....25%
Blacksmiths'.....25%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard...30%
Drill Chucks, New Model.....25%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....25%
Universal Lathe Chucks.....40%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Gear Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%
Wescott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....40%
Little Giant Double Grip Drill.....40%
Little Giant Drill, Improved.....40%
Oneida Drill.....40%
Scroll Combination Lathe.....40%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.....50%
Carriage Makers' Sargent's.....60%
Besly, Parallel.....33⅓&10%
Linemans, Udica Drop Forge & Tool Co.40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel....₱ doz. $4.05 net
Star Shank, All Steel....₱ doz. $3.24 net
W. & C. Snaug, All steel, 7½ in. ₱ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@33⅓&10%
P., S & W.....50@50&5%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company
'98 Chicago Horse.....$8.75
1902 Chicago Horse.....$10.75
Lightning Belt.....$15.00
Chicago Belt.....$20.00
Stewart's Patent Sheep.....$18.50
(Case lots 15%)

Clips Axle—

Eagle and Superior ¼ and 5-16 inch.....70c&10%
Norway, ½ and 5-16 inch..70@70c&10%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression and Plain Bibbs.....65c&5@65c&10%
Globe, Kerosene, Racking, &c., Cocks.....65c&10@70%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—

Brass, Walter B. Stevens & Son's list.40%
Embossed, Gilt, Walter B. Stevens & Son's list.....30&10%
Leather, Walter B. Stevens & Son s list40%

Combs Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses Dividers, &c.

Ordinary Goods.....75@75c&5%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....25&10%

Compressors Corn Shock—

J. B. Hughes' ₱ doz.....$2.50

Conductor Pipe, Calva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
Eastern....	7c&12½%	70c&7½%
Central.....	7c&7½%	70%
Southern...	65c&10%	65c&5%
S. Western..	65c&7½%	65c&2½%

Terms, 2% for cash. With delivery on fast crates.
See also *Eave Troughs.*

Coolers, Water—

Gal. each.	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal...	2	3	4	6	8
Galv. Lined Ea.	$1.85	$2.00	$2.25	$2.90	$3.90

25%

Ga.v. Lined side handles

Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15..25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....*lb. 25c*
Braided, White, Com.... *lb. 17½@18c*
Cable Laid Italian...*lb. A, 18c; B, 16c*
Common India.....*lb 9 @9½c*
Cotton Sash Cord, Twisted....12@16c
Patent Russia.....*lb. 12½@13c*
Cable Laid Russia.....*lb. 13½@14c*
India Hemp, Braided.....*lb 14@15c*
India Hemp, Twisted.....*lb. 10@12c*
Patent India, Twisted.....*lb.10@12c*

Anniston Cordage Co.:
Old Glory, Nos. 7 to 12.....₱ lb 24 c
Anniston, Nos. 7 to 12.....₱ lb 19 c
Old Colony, Nos. 7 to 12.....₱ lb 18½c
Anniston Drab, Nos. to 12.....₱ lb 24 c
Pearl Braided, cotton.....₱ lb 17½c
Massachusetts, White.....₱ lb 22½c
Massachusetts, Drab.....₱ lb 26½c
Eddystone Braided Cotton.....₱ lb 19c
Harmony Cable Laid Italian.....₱ lb 18c
Osgawan Mills:
Crown, Solid Braided White...₱ lb 22c
Braided, Giant, White.....₱ lb 20c
Peerless:
Cable Laid Italian.....16c
Cable Laid Russian.....14c
Cable Laid India.....12c
Braided India.....18c
Phœnix, White.....19c
Samson, Nos. 7 to 12:
Braided, Drab Cotton.....₱ lb 32½c
Braided, Italian Hemp....₱ lb 32½c
Braided, Linen.....₱ lb 49c
Braided, White Cotton, Spot.₱ lb 28½c
No. 6 cords, 1c extra.
Silver Lake:
A quality, Drab, 40c.....15%
A quality, White, 35c.....15%
B quality, Drab, 35c.....15%
B quality, White, 30c.....15%
Italian Hemp, 40c.....15%
Linen, 57½c.....15%

Wire, Picture—

List Oct., '00.....85c&10@85c&10c&5%

Crackers, Nut—

Little Giant.....₱ gr. $24.00

Cradles—

Grain.....50%

Crayons—

White Round Crayons, gross.5½@6c
Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
(Case lots 20%)
See also *Chalk.*

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 Medium Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₱ doz. $3.00
No. 77 Medium Knives.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

Hale's..Nos. 11 & 111 12 & 112 13 & 113
Per doz.. $8.00 10.75 14.50
American.....30%

Nos.	1	2	3	4	5
Each	$5	$7	$10	$25	$50

Enterprise.....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's, ₱ doz.....30&10&40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₱ doz. $22.75.....50&10%
Little Giant, ₱ doz.....33⅓&5@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$71.00	$68.00

N. E. Food Choppers.....40%
Sterling.....40@40&1 %
No 1....$5.00 each No. 2. $2.50 each
New Triumph No. 605, ₱ doz. $24.00.
Woodruff's, ₱ doz.....30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Sterling, $6.00 each.....33⅓%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr....$22@$30

Tobacco—

All Iron, Cheap.....*doz. $4.25@$4.50*
Enterprise.....25&5%
National, ₱ doz. No. 1, $21: No. 2, $18..40%
Sargent's, ₱ doz. No. 2.....60%
Sargent's No 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz. $16.00.....50&10%
Bonney's.....40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger...per doz., $9.00
Iwan's Improved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers, ₱ doz.....$6.75
Iwan's Perfection Post Hole Digger.....₱ doz. $8.50
Iwan's Split Handle Post Hole Diggers.....₱ doz.....$7.50
Kohler's Universal.....₱ doz. $15.00
Kohler's Little Giant.....₱ doz. $12.60
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.50
Kohler's Pioneer.....₱ doz. $7.50
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson ₱ dos. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, 7x4 in.....₱ doz, $10.50
Phillips', style 077, 7x4 in.....₱ doz, $8.00
Phillips', style x-v, 7x4 in.....₱ doz, $11.00
Porter's Plain, No. 6.....₱ doz. $8.75
Porter's Ornamental, No. 70, ₱ doz. $10.50
Porter's No. 94.....$9.00
Porter's No. 44.....$10.75

Drawers Money—

Sun Money Drawer, No. 3, ₱ doz. $9.00; No. 6 with Bell, $ 0.00; No. 7, with Gong, $ 0.00.
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Drills and Drill Stocks—

Common Blacksmiths' Drill...each $1.50@$1.75
Blacksmiths' Self-feeding..$3.75@$4.00
Breast, Millers Falls.....15c to 60c
Breast, P., S. & W.....40&5%
Goodell Automatic Drills..40&5%@40&10%
Jones & Lamson Automatic Drills No. 2 to 3.....70% & 10%
Johnson's Drill Points.....16⅔&5&1%
Millers Falls Automatic Drills....33⅓&10%
Ratchet, Curtis & Curt's.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P. S. & W.....50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60c&10@60c&10c&10%
Taper and St Shank.....60c&10@60c&10c&5%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drivers, Screw—

Screw Driver Bits..per doz. ..45@75c
Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....30%
Champion.....50%
Edson.....60%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet.....75%
Goodell's Auto50&10&10@50&10&10&5%
Hurwood.....40%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....40&10%
Millers Falls, No. 2 and 21.....50&10%
Millers Falls, Nos. 11, 12, 41, 42.....15&10%
Never Turn.....6 ½%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60.....60%
Nos. 20 and 40.....70%
Smith & Hemenway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles30@60&10&10%
No. 86.....70@70&10&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*	
Eastern.....	.....75c&10%	
Central.....	75c&12½%	
Southern.....	75c&2½%	
S. Western..	.....	75%

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Elbows and Shoes—

Factory shipments.....60%
Perfect Elbows (S. S. & Co.).....30%

Emery, Turkish—

	4 to 6	*5 to 150*	*Flour*
Kegs.....	*lb. 5c*	5½c	5½c
½ Kegs.....	*lb. 5¼c*	5¾c	5¾c
Kegs.....	*lb 5c*	6c	
10-lb cans. 10 in case	6½c	7c	6c
10-lb. cans, less than 10	10c	10c	8c

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's.....50&10%
Walling's.....50%

Cord and Weight—

Ives.....40%

Faucets—

Cork Lined.....50@50c&10%
Metallic Key, Leather Lind.70@70c&10%
Red Cedar.....40c&10@50%
Petroleum.....70c&5@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key.... 40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined..50%
John Sommer's Reliable Cork Lined.....50&10%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's No Brand, Cedar.....50%
John Sommer's Perfection Cedar.....40%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¼ and ⅜ inch.....35%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40&10%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $36..40&10%

Felloe Plates—

See *Plates, Felloe.*

Files—Domestic—

List revised Nov. 1, 1899.
Best Brands.....70c&5@70c&10c&5%
Standard Brands....75c&5@75c&10c&7%
Second Quality.....75c&10c&10@80c&5%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....30%

Fixtures, Grindstone—

Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.60*	*2.75*	*3.00*	*3 50*	*4.40*

P., S. & W. Co.....30&1C@40%
Reading Hardware Co.....60%
Sargent's.....60&10&10%
Stowell's Giant Grindstone Hanger.....₱ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures Light.....60&10%

Fodder Squeezers—

See *Compressors.*

Forks—*Aug. 1, 1899, list.*

Hay, 2 tine.....67½
Hay 3 tine.....60&5%
Hay, 4 tine.....60&5%
Hay, Header and Baler 3 tine 6 & 15%
Hay, Header and Baler, 4 tine 60&5%
Grain or Barley.....70%
Manure, 4 tine.....60&20%
Manure, 5 and 6 tine.....60&20%
Spading.....70&5%

Extra 10%

Iowa Dig-Ezy Potato.....65%
Victor, Hay.....60&5%
Victor, Manure.....60&5%
Victor, Header.....60&5%
Champion, Hay.....60&5%
Champion, Manure.....60&20%
Columbia, Hay.....60&5%
Columbia, Manure.....70%
Columbia, Spading.....70&10%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....65%
Acme Hay.....60&10&7½%
Acme Manure, 4 tine.....60&20&10%
Acme Manure, 6 tine.....60&5&10&2%
Dakota Header.....65&15&5%
Jackson Steel Barley.....65&15&5%
Kansas Header.....60&5%
W. & C. Favorite Wood Barley 4 tine, ₱ doz., $5.00; 6 tine, $6.00.
Plated.—See *Spoons*.

Frames— Saw—

Red, Polished and Varnished..doz. $1.15@$1.30
White.....*doz.* 75@80c

Freezers Ice Cream—

Qts...	*3*	*4*	*6*	*8*	*10*
Best	$1.45	1.65	1.95	2.40	3.20	4.30
Good	$1.25	1.40	1.70	2.15	2.75	3.70
Fair	$1.00	1.10	1.30	1.75	2.40	2.90

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly*.

Fry Pans—See *Pans, Fry*.

Fuse— *Per 1000 Feet.*

Hemp Fuse.....$2.60
Cotton Fuse.....2.90
Single Taped Fuse.....3.25
Double Taped Fuse.....4.20
Triple Taped Fuse.....5.00

10&25%

Gates, Molasses and Oil—

Stebbins' Pattern.....80@80&10%

Gauges—

Marking, Mortise, &c.....50&10@50&10&10%

Chapin-Stephens Co.:
Marking, Mortise, etc..50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Fulton's Butt Gauge.....30&10%
Stanley R. & L. Co.'s Butt & Rabbet Gauge.....20@20&10&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P., S. & W. Co.....30&10%

Gimlets— Single Cut—

Nail, Metal, Assorted..gro. $1.50@1.60
Spike, Metal, Assorted gro. $2.80@3.35
Nail, Wood Handled, Assorted, gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $2.25@2.50

Glass, American Window

Jobbers' List, Dec. 16, 1902.
From store. Single and Double.....90&10%
F. O. B. factory, carload lots:
Single and Double.....90&20&2½%
2000 box lots.....90&25%

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10&10%

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush.....37½@50%
List B, Cans (½ pts., pts., qts.).....33⅓@48%
List C, Cans (½ gal., gal.).....25@45%
International Glue Co. (Martin's).....40&10&5%

Grease, Axle—

Common Grade.....*gro.* $5.00@6.00
Dixon's Everlasting....10-lb pails, ea. 85c
Dixon's Everlasting, in bxs., ₱ doz. 1 lb $1.20; 2 lb $2.00

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz.....$2.00
Pike Mower Knife and Tool Grinder, each.....$3.00
} 33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames.....each, $3.25

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000.....$9.00
Copper ₱ 1000.....$18.00

Halters and Ties—

Covert Mfg. Co.:
Web.....45&25%
Jute Rope.....40&5&25%
Sisal Rope.....20&5%
Covert's Saddlery Works:
Web and Leather Halters.....20%
Jute and Manila Rope Halters.....20%
Sisal Rope Halters.....20&10%
Jute, Manila and Cotton Rope Ties..20%
Sisal Rope Ties.....60&10%

Hammers—Handled Hammers—

Heller's Machinists'..40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40@40&10&10%
Peck, Stow & Wilcox.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7½@33⅓&1₱&7½%
Engineers' and B. S. Hand.....50&7½&5@50&10&7½&5%
Machinists' Hammers.....50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

8 lb. and under...*lb.* 45c } 75&5@75
8 to 5 lb.....*lb.* 36c } &10%
Over 5 lb.....*lb.* 30c }
Wilkinson's Smiths'.....9½c@10c *lb.*

Handles—

Agricultural Tool Handles—

Axe, Pick, &c.....4@50&5%
Hoe, Rake, &c.....60@60&5%
Fork, Shovel, Spade, &c.:
Long Handles.....60%
D Handles.....50%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted.....*gro.* $2.30@2.50
Brad Awl.....*gro.* $1.25@1.50
Chisel Handles:
Apple Tanged Firmer, gro. ass'd, $2.25@2.35; large, $2.50@2.60.
Hickory Tanged Firmer, gro. ass'd, $1.75@2.20; large, $3.50@3.70.
Apple Socket Firmer, gro. ass'd, $1.70@1.85; large, $2.60@2.25
Hickory Socket Firmer, gro. ass'd, $1.60@1.75; large, $1.75@2.00
Hickory Socket Framing, gro. ass'd, $2.50@2.75; large, $2.65@2.85
File, assorted.....*gro.* $1.00@1.15
Hammer, Hatchet, Axe, &c.....50%
Hand Saw, Varnished, doz. 70@75c
Not Varnished.....55@60c
Plane Handles:
Jack, doz.25c; Jack Bolted..55@60c
Fore, doz.35@38c; Fore, Bolted.. 70@75c

Extra 5&10% often given.

Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle, ₱ gro.....$0.35@$1.50

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch.....	*3*	*4*	*5*	*6*	*8*
Single Doz.	$0.85	1.20	1.50	1.90	2.30

Barn Door, New England Pattern, Check Back, Regular:

Inch.....	*3*	*4*	*5*	*6*
Single Doz.	$1.10	1.60	2.15	2.70

Allith Mfg. Co.
Reliable.....per doz. $15.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.15
Parlor, Standard.....$3.35
Parlor, New Model.....$2.85
Parlor New Champion.....$2.25
Barn Door, Standard.50&10&10&5%
Covered.....50&10&10%
Special.....50&10&10&5%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
Giant.....50&10%
New York.....60%
Peerless.....60&10%
Sterling.....60%
Swing, No. 95.....50&10%
Union, No. 44, $5.00: No. 45 $7.00; No. 46, $9.00.
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.50&10% (net)
C. S. Smith Mfg. Co.:
Lundy Parlor Door.....50&10%
Monarch Barn Door.....60&10%
Never Jump Hinge.....50&10%
Peerless.....60&10%
Perfection.....70&5%
Phœnix.....70&5%
Wagner's Adjustable.....70&10%
Warehouse Anti-Friction.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3.....$2.25
Imp'd Wood Track No. 5.....$2.35
Imp'd Steel Track No. 7.....$2.70
Imp'd Steel Track No. 7.....$2.65
Ball B'r'g Steel Track No. 9.....$2.50
Ball B'r'g Steel Track No. 10.....$2.50
Roller B'r'g Steel Track No. 11...$2.45
Roller B'r'g Steel Track No. 12...$2.40
Ball B'r'g Steel Track No. 13..$2.75
Roller B'r'g Steel Track No. 14. $2.65
Ball B'r'g Trolley Track No. 15 ..40%
Ball Brg Trolley Track No. 19...40&5%
Ball Bearing Tandem Trolley Track No. 16.....40%
Silent Adjustable Track No. 18...40%
Auto Adjustable Track No. 22...40%
Trolley B. D. No. 17.....$1.60
Trolley F. D. No. 120.....$2.70
Trolley F. D. No. 121.....$2.85
Trolley F. D. No. 151.....$3.00
Roller Bearing D. D. No. 25.....50&5
Roller Bearing U. S. B. D.....70&5%
Anti Friction B. D.....60&10%
Ives' Wood Track No. 1.....$2.15
Ives' Imp'd Wood Track No. 2..$2.15
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing.....40%
Atlas.....60%
Badger Barn Door.....50%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator.....40%
Express.....50%
Interstate.....60%
Lundy Parlor Door.....50%
Magic.....50%
Matchless.....60%
Nansen.....60&10%
Railroad.....50%
Street Car Door.....50%
Steel, Nos. 300, 404, 500.....40&15%
Stowell Parlor Door.....50%
Wild West, Nos. 300, 404, 500.....50%
Zenith for Wood Track.....50%
A. L. Swett Iron Works:
Eagle.....60&10%
Hylo.....50&10%
Perfection.....60%
Pilot.....50%
Taylor & Boggis Fy Co..50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....40%
Underwriters' Roller Bearing ...40%
Velvet.....50%
Wilcox Auditorium Ball Bearing.30%
Wilcox Barn Trolley No. 123.....40%
Wilcox Elv. Door, Nos 122 and 122½.50%
Wilcox Elv. Door, No. 132.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox O. K. Steel Track.....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing....40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%

Extra 5&10% often given.

For Track, see *Rail*.

Hangers, Gate—

Myers' Patent Gate Hangers, ₱ doz., net, $4.50

Hasps—

McKinney's Perfect Hasp ₱ doz.....50%

Hatchets—

Best Brands.....50@50&10%
Cheaper Brands.....60@60&10%
Note.—Net prices often made.

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1898 O. P. Niagara; Clark's O. P.; Clark' Tip; Buffalo.)

No.....	*1*	*3*	*5*
Doz. pair.....	$0.85	1.75	3.50

Mortise Shutter; (L. & P., O. S., Dixie, &c.)

No.....	*1*	*1½*	*3*	*3½*
Doz. pair....	$0.70	.65	.60	.55

Mortise Reversible Shutter, (Buffalo, &c.)

No.....	*1*	*1½*	*3*
Doz. pair....	$0.75	.70	.65

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70&75%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13.....70&10&70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $0.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter.....7 &5%
Acme, Lull & Porter.....75%
Queen City Reversible.....75%
Stenger's Positive Locking, Nos. 1 & 3.....70&10%
Shepard's Noiseless, Nos. 60, 65, 55...70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75%
1868, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pat'n, Nos. 1, 3 & 5.....75%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75..75%
Steamboat Gravity Locking, No. 10..75%
Pioneer, Nos. 000, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.....	*1*	*2*	*3*
Hinges with Latches.	$3.00	2.50	5.00
Hinges only.....	$1.40	2.05	3.80
Latches only.....	.70	.70	.35

New England:
With Latch.....*doz.* ....@$2.50
Without Latch....*doz.* ....@$1.80
Reversible Self-Closing:
With Latch.....*doz.* ....@$1.80
Without Latch.....*doz.* ....@$1.45
Western:
With Latch.....*doz.* $1.80
Without Latch.....*doz.* $1.20
Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets.

No.	1	2	3
Hinges with Latches.	$3.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	1.35

Spring Hinges—

Holdback, Cast Iron, gro. $7.00@10.00
Non-Holdback, Cast Iron gro $7@7.50

J. Bardsley
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer Ball Bring Floor Hinges40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges.....50%
Chicago (Ball Bearing) Floor Hinge.....45%
Garden City Engine House..35%
Keene's Saloon Door.....35%
Columbian Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....20&5%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable, No. 7. ₱ gr. $12.00
Gem, new list.....30%
Clover Leaf.....₱ gr. $12.50
Oxford, new list.....30%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable $9.50
Lawson Mfg. Co.:
Marchl ss.....35%
Matchless Pivot.....45%
Shelby Spring Hinge Co.:
Crown Jamb Hinge.....40%
Chief Ball Bearing Floor Hinge.45%
Royal Ball Bearing Floor Hinge..45%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....15%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges.....80&5%
Heavy Strap Hinges 80&20&10%
Light T Hinges.....75&10&5%
Heavy T Hinges.....75&5%
Extra Heavy T Hinges ..8 &2%
Hinge Hasps.....0%
Cor. Heavy Strap....80&20&10%
Cor. Ex. Heavy T.....80&20

Extra 10@10&5%

Screw Hook and Strap. { *6 to 12 in*..... *lb.* 3½c; *14 to 20 in*..... *lb.* 3½c; *22 to 36 in*..... *lb.* 3 c
Screw Hook and Eye:
¾ to 1 inch.....*lb.* 5 c
⅝-inch.....*lb.* 6 c
½-inch.....*lb.* 7 c

Miscellaneous—

Hoffman's Steel Spring Butt Hinges.....40&10%
Hoffman's Offset Refrigerator Hinges.....40&10%

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.....35%

Hods, Coal—

Inch.....	*15*	*16*	*17*	*18*
Galv. Open	$2.50	2.75	3.00	3.25 ₱ doz.
Jap. Open	$2.00	2.25	2.50	2.75 ₱ doz.
Galv. Funnel	$3.00	3.25	3.50	3.75 ₱ doz.
Jap. Funnel	$2.50	2.75	3.00	3.25 ₱ doz.

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10
Hoffman's:
Brick.....each $1.10
Masons'.....each $2.00
Plasterers'.....each $3.20

Hoes— Eye—

Scovil and Oval Pattern.....60c&10@60c&10&10%
Grub, list Feb. 23, 1899.....70@70c&10%

Handled—

Aug. 1, 1899, List:
Garden.....70 &10%
*Meadow & Rhode Island*75c&10%
Southern Meadow..75c&5&2½%
Mortar and Street.....75c&10%
Planters', Regular Pat'n.70&30%
Cotton.....75c&10%
Toy, Ladies', Boys', Onion, Turnip, Berry or Tobacco.70c&10&5%

Extra 20%

Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Cotton Hoe.....75&7½%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10%
Ft. Madison Mattock Hoes:
Regular Weight..₱ doz. $5.00
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.00
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....60%
W. & C. Ivanhoe.....75&2%
B. B. Cultivator Hoe.....75&10&2%
Acme Weeding.....75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hoisting Apparatus—

See *Machines, Hoisting*.

Holders— Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Empire.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓%

Hooks— Cast Iron—

Bird Cage, Reading.....60%
Bird Cage, Sargent's List.....60%
Ceiling, Sargent's List.....40&10%
Clothes Line, Hoffman's.....40&10%
Clothes Line, Reading List 65&10@65&10&10%
Clothes Line, Sargent's List. 50&20&10%
Coat and Hat, Sargent's List.....45&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70&75%
Coat and Hat, Wrightsville.....65%
Harness, Hoffman.....per doz. 35@40c
Harness, Reading List.....70&10&75%

Wire—

Belt.....80%
Wire C. & H. Hooks.60c&10@60c&10&10%
Atlas, Coat and Hat:
Single Cases.....50%
10 Case Lots.....50&10%
Czar Harness.....50&10&5%

Wire Coat and Hat:
Acme....60%
B. B....60%
V Brace, Chief and Czar....60%
Gem....60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton....doz. $1.05@1.25
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—

Rush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass....Nos. 1 2 3 4
Best.... $1.50 1.75 2.00
Common.. $1.30 1.30 1.50 1.60
Potato and Manure....66⅔&20%
Whiffletree....lb. 5½c
Hooks and Eyes:
Brass....60c&10c&10@70%
Malleable Iron....70c&5@70c&10%
Covert Saddlery Works' Self Locking Gate and Door Hook....60%
Ft. Madison Cut-Easy Corn Hooks, ₱ doz. $5.25 net
Crown Picture....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives. Corn.*

Horse Nails—See *Nails. Horse Horseshoes—*

See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition....ft. 4¼@ 4¼c
2-ply Standard....ft. 6 @ 6½c
4-ply Standard....ft. 7½@ 8 c
3-ply extra....ft. 8½@ 9 c
4-ply extra....ft. 10½@11 c
Cotton Garden, ¾-in., coupled:
Low Grade....ft. 6 @7 c
Fair quality....ft. 8 @9 c

Irons— Sad—

From 4 to 10....lb 2¾@3c
B. B. Sad Irons....lb. 3@3¼c
Chinese Laundry....lb. 4½@5c
Chinese Sad....lb. 3¾@4c
Mrs. Potts', per set:
Nos.... 50 55 60 65
Jap'd Tops....74c 71c 81c 81c
Tin'd Tops....77c 74c 87c 84c
New England Pressing, lb.. 3½@3¼c

Pinking—

Pinking Irons....doz. 50@60c

Soldering—

Soldering Coppers 1½ and 3.. 21@22
1½ and 2....23@24c
Covert Mfg. Co....20&2%

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw....30&5%
Steel....35&2%
Covert's Saddlery Works':
Daisy....60&10%
Victor....60&10%
Lockport....50%
Lane's Steel....30&10%

Kettles—

Brass, Spun, Plain....20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c....30%
Hartzell Cutlery Co....50%
Smith & Hemenway Co....40&10%
Hay and Straw—See *Hay Knives.*

Corn—

Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List....70&5@70c&10%
Bradley's....⅞
C. E. Jennings & Co. Nos. 45, 46..60&10%
Jennings & Griffin. Nos. 51, 52..60&10&10%
Swan's....70&10&2½%
Watrous....16⅔&10%
L. & I. J. White....20&5@25%

Hay and Straw—

Lightning....₱ doz. $6.50@7.00
Iwan's Sickle Edge....₱ doz. $10.00
Iwan's Serrated....₱ doz. $10.00
Maine....₱ doz. $8.50

Mincing—

Buffalo....₱ gro. $13.00

Miscellaneous—

Farriers'....doz. $2.00@3.00
Woolenholm's....₱ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip, gro....$1.10@1.20
Carriage, Jap, all sizes..gro. 25@30c
Door, Mineral....doz. 65@70c
Door, Por. Jap'd....doz. 70@75c
Door, Por. Nickel....doz. $2.05@2.15
Bardsley's Wood Door, Shutter, &c....15%
Picture, Sargent's....60&10%

Lacing Leather—

See *Belting Leather—*

Ladders Step Etc.—

Lane's Store....25%
Myers Wooden Store Ladders....50%

Ladles— Melting—

L. & G. Mfg. Co....25%
P. S. & W....50%
Reading....60%
Sargent's....45&10%

Lanterns— Tubular—

Regular Tubular No. 0..doz. $4.35@4.75
Lift Tubular..No. 0..doz. $4.75@5.25
Hinge Tubular, No. 0..doz. $4.75@5.25
Other Styles....40c&10@40c&10c&5%

Bull's Eye Police—

No. 1 2¾ inch....$2.50@2.75
No. 2, 3 inch....$2.75@3.00

Latches— Gate—

Hoffman's Safety Gate....₱ doz. 60c

Thumb—

Roggin's Latches, with screw..dz35@40c

Leaders Cattle—

Small....doz. 55c; large, 60c
Covert Mfg. Co....15&2%

Lifters, Transom—

R & E....33⅓%

Lines—

Wire Clothes, Nos...	*18*	*19*	*20*
100 feet....	*$2.20*	*2.00*	*1.65*
75 feet....	*$1.80*	*1.70*	*1.30*

Ossawan Mills.
Crown Solid Braided Chalk....33⅓%
Mason's, No. 0 to No. 5....33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3....10%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr....30%
Anniston Waterproof Clothes, 50 lt., ₱ gro.; $22.00; Gilt Edge, $30.00; Air Line $21.00; Acme, $15.00; Alabama, $15.00; Empire, $13.50; Advance, $13.50; Alliston, $11.50; Calhoun, $10.00; Oriole, $20.00; Albermarle, $25.50; Eclipse, $11.00; Chicago, $10.00; Standard, $9.00; Columbia, $8.00.

Locks— Cabinet—

Cabinet Locks....33⅓@33⅓&7½%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]
Reading Hardware Co....50%
R. & E. Mfg. Co....40%
Sargent & Co....40@40&10%

Elevator—

Stowell's....40%

Padlocks—

Wrought Iron....75&10c&5@80c&5%
R. & E. Mfg. Co. Wrt. Steel and Brass....75&75&10%

Sash, &c.—

Ives' Patent.:
Bronze and Brass....55&7½%
Crescent....50%
Iron....60&2½%
Wrought Bronze and Brass....50&5%
Wrought Steel....55%
Reading....60c&10&10@70%

Machines— Boring—

Com., Upright, Without Augers..$2.00
Com., Angular, Without Augers..$2.25
Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3.	$4.25	No. 1 $5.00
Improved No. 4.	3.75	No. 2. 3.38
Improved No. 5.	2.75	
Jennings'...	No. 4, 3.15	No. 1, 3.50
Millers' Falls....		5.75
Snell's, Rice's Pat.	2.50	2.75

Holsting—

Moore's Anti-Friction Differential Pulley Block....30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist....25%

Ice Cutting—

Chandler's....15&10%

Washing—

Boss Washing Machine Co.:	Per doz.
Boss No. 1; Boss Rotary....	$57.00
Boss No. 7; Dietz Rotary....	$60.00
Champion Rotary; Banner No. 1..	$54.00
Standard Champion No. 1....	$48.00
Standard Perfection....	$36.00
Cintl Square Western....	$30.00
Uneeda American, Round....	$29.00

Mallets—

Hickory....45&5@50%
Lignumvitæ....45c&5@50%
Tinners', Hickory and Applewood, doz....50@55c

Mats— Door—

Elastic Steel (W. G. Co.)....10%

Mattocks—

See *Picks and Mattocks.*

Menders Hose

Robinson's Hose Menders....₱ gro, $2.00

Milk Cans—See *Cans, Milk*

Mills— Coffee, etc.—

Enterprise Mfg. Co....25@30%
Hoffman's Side, Coffee and Spice....₱ doz. $1.25
National, list Jan. 1, '94....30%
Parker's Columbia & Victor....50&10@60%
Parker's Box and Side....50&10@60%
Sun, No. 108', 1 ℔ mill....₱ doz. $3.00
Swift, Lane Bros Co....30%

Mowers, Lawn—

Net prices are generally quoted.
Cheap....all sizes. $1.90@1.95
Good....all sizes, $2.25@2.50

	10	*12*	*14*	*16-inch*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Continental....60&10%
Great American....⅞
Great American Ball Bearing....60&10%
Quaker City....70%
Pennsylvania....60&10%
Pennsylvania Ball Bearing....60&5%
Pennsylvania Golf....50%
Pennsylvania Horse....40%
Pennsylvania Pony....45%
Philadelphia:
Style S, M., S., C., K., T....70&10%
Style A, all Steel....65&10%
Style E, High Wheel....70&10&5%
Drexel and Gold Coin, low list...50&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899....
85c&10c&10@85c&10c&10c&10%
Lungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*
A. C.	*25c*	*23c*	*22c*	*21c*	*21c....40&5%*
Ausable	*27c*	*26c*	*25c*	*24c*	*23c..50&10%*
C. B. K.	*25c*	*25c*	*22c*	*21c*	*21c....40%*
Champ'in	*28c*	*26c*	*25c*	*24c*	*23c40&10&5%*
Clinton	*19c*	*17c*	*16c*	*15c*	*14c30&10&5%*
Maud S.	*25c*	*23c*	*22c*	*21c*	*21c....50%*
Putnam	*23c*	*21c*	*20c*	*19c*	*18c....33⅓%*
Putnam					
Cold Rol'd	*19c*	*18c*	*17c*	*16c*	*....10&10%*
American, Nos. 5 to 10					₱ ℔....9&9½c
Neponset	Nos. 5 to 10				₱ ℔ 12c

Jobbers' special brands...per lb. 8@9c

Picture

	1½	*2*	*2½*	*3*	*3½ in.*
Brass Head.	*.55*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head...	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Crown Picture Nails....₱ gro. $1.50

Nippers, See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, plain....$4.70
Hexagon, plain....$4.60
Square, C. T. & R....$4.70
Hexagon, C. T. & R....$4.60
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank....$4.80
Hexagon Blank....$5.00
Square Tapped....$4.60
Hexagon Tapped....$4.80

Oakum—

Best or Government....lb. 6¼c
Navy....lb. 4½c
U. S. Navy....lb. 5½c
Plumbers' Spun Oakum....2¾c
In carload lots ¼c lb. off f. o. b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper....65@65c&10%
Tin or Steel....70c&10@75%
Zinc....75@75c&10%
Chase or Paragon:
Brass and Copper....65c&5@65c&10%
Tin or Steel....75@75c&10%
Zinc....76@76c&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans....70@70&10%
Railroad Oilers etc....60@60&10%

Openers— Can—

French....doz. 35c
Iron Handle....doz. 25@27c
Sprague, Iron Hdle..per doz. 35@40c
Sardine Scissors...doz. $1.75@$3.00
Marvel....per doz. $1.25
National....50%
Stowell's....per doz. 35c&45c
Tip Top....per doz. $0.75

Egg—

Nickel Plate....per doz., $2.25
Silver Plate....per doz., $3.50

Packing—

Asbestos Packing, Wick and Rope, 15@15½c lb.

Rubber—

Sheet, C. I....8@12c
Sheet, C. O. S....9@15c
Sheet, C. B. S....10@14c
Sheet, Pure Gum....50@70c
Sheet, Red....35@40c
Jenkins' Standard, ₱ ℔ 80c....25&25&5%

Miscellaneous—

American Packing....7@10c lb.
Cotton Packing....15@14c lb.
Italian Packing....9@12½c lb.
Jute....3½@4c lb.
Russia Packing....7@11c lb.

Pails— Creamery

S. S. & Co., with gauges.. No 1 $6.25; No. 2, $5.50 ₱ doz.

Galvanized—

Price per doz.

Quart....	*10*	*12*	*14*
Water, Regular..	*1.75*	*2.00*	*2.25*
Water, Heavy....	*2.75*	*3.00*	*3.25*
Fire, Rd. Bottom.	*2.30*	*2.60*	*2.80*
Well....	*2.25*	*2.50*	*2.75*

Pans— Dripping—

Standard List....60c&5@60c&10%

Fry—

Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.95*	*1.05*	*1.15*	*1.30*	*1.65*

Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.25; 20, $5.75; 30, $6.25.
Simplex, ₱ doz.:

No.	40	50	60	140	150	160
	$2.75	3.25	3.75	3.00	3.25	4.00

Paper—Building Paper—

Asbestos: *lb.*
Building Felt....2¾c
Mill Board, sheet, 40 x 50 inches 3½c
Mill Board, roll, thicker than 1-16 inch....3¼c
Mill Board, roll, 1-16 in. thick and less....2½c
Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light wt., 25 lbs. to roll..$0.43@0.50
Medium wt., 30 lbs. to roll..$0.48@0.55
Heavy wt., 40 lbs. to roll..$0.68@0.75
Black Water Proof Sheathing, 500 Sq. ft., 1 ply, 65c; 2 ply, 85c; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 2, 3 and 4½ sq. ft. to lb., ton....$45.00
Red Rope Roofing, 250 sq. feet per roll....$1.65
NOTE.—*These goods are often sold at delivered prices.*

Tarred Paper.

1 ply (roll 200 sq. ft.), ton..$32.50@35.00
2 ply, roll 108 sq. ft....60@65c
3 ply, roll 108 sq. ft....82@87c
Slater's Felt (roll 500 sq. ft.)....75c
NOTE.—*Above prices often include discovery.*
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.)....$2.75

Sand and Emery—

Flint....60@65c&10%
Garnet....25@20@15%

Parers— Apple—

Advance....₱ doz. $4.50
Baldwin....₱ doz. $5.00
Bonanza Improved....each $6.50
Dandy....each $7.50
Eureka Improved....each $20.00
Family Bay State....₱ doz. $15.00
Improved Bay State....₱ doz. $36.00
New Lightning....₱ doz. $7.50
Reading 72....₱ doz. $4.00
Reading 78....₱ doz. $7.00
Turn Table '98....₱ doz. $6.75
White Mountain....₱ doz. $6.00

Potato—

Saratoga....₱ doz. $7.00
White Mountain....₱ doz. $6 00

Paris Green—

Less than 1 ton.	*per lb.*
Arsenic kegs or casks....	*12½c*
Kegs, 100 to 175 lbs....	*13 c*
Kits, 14, 28, 56 lbs....	*14 c*
Paper boxes, 2 to 5 lbs....	*14 c*
Paper boxes, 1 lb....	*14½c*
Paper boxes, ½ lb....	*15 c*
Paper boxes, ¼ lb....	*16 c*

1 to 5 tons, 1 cent per lb. less; 5 tons and over, 1½ cents per lb. less.

Picks and Mattocks—

List Feb. 23, 1899....65&10@70%

Pinking Irons—

See *Irons, Pinking.*

Pins— Escutcheon—

Brass....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Standard, 2-6 in....50&10%
Extra Heavy, 2-6 in....65%
Fittings....70%

Pipe, Merchant,

Steel or Iron, Carload Lots, f. o. b, Pittsburgh.

Merchant Pipe.	*Black.*	*Galvanized.*
¼, ¼, ⅜ inch....	*68%*	*58%*
½-inch....	*70%*	*60%*
¾ to 6 inch....	*75%*	*65%*
7 to 12 inch....	*73%*	*59%*

Less than carloads, 12½% advance.

Pipe Sewer—

Jobbers' Prices—
Standard Pipe and Fittings, 2 to 24 in.
New England....70%
New York and New Jersey....73%
Maryland, Delaware, East Penn. 75%
West Penn and West Va....70%
Virginia....78%
Ohio, Michigan and Ky....78%
Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:

	C. L.	L. C. L.
5 in., per 100 joints ...	$7.50	$8 50
6 in., per 100 joints....	8.00	9.00
7 in., per 100 joints....	9.00	10.00

Planes and Plane Irons—

Wood Planes—

Bench, First quality....40c&5@40c&10%
Bench, Second qual....50c&5@50c&10%
Molding....33⅓c&5@33⅓c&10%
Bailey's (Stanley R. & L. Co) 5&10@25&10&10%
Chapin-Stephens Co.:
Bench, First Quality....40@40&10%
Bench, Second Quality....50@50&10%
Molding....33⅓@53⅓&10%
Toy and German....40@40&10%
Gage Self Setting....35%
Union....60%

Iron Planes—

Bailey's (Stanley R. & L. Co)....95&10@25&10&10%
Chaplin's Iron Planes....50&10%
Miscellaneous Planes (Stanley R. & L. Co.)....20&10@20&10&10%
Sargent's....60%
Union....60%

Plane Irons—

Wood Bench Plane Irons....30c&5@30c&10%
Buck Bros....30%
Chapin-Stephens Co....30@30&10%
Stanley R. & L. Co...20&10@20&10&10%
L. & I. J. White....20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse....₱ doz. $8.50

Plates—

Felloe....lb. 3¼@4c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00....50%

Pliers and Nippers—

Button Pliers....75@75c&10%
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45
Gas Pipe.. 7 8 10 12-in.
$1.75 $2.00 $2.75 $3.75
Acme Nippers....50@50&5%
Bernard's:
Parallel Pliers....95%
Paragon Pliers....50&5%
Lodi Pliers....50&5%
Elm City Fence Pliers....35%
Cronk & Carrier Mfg. Co.:
American Button....75&10%
Cronk's....60%
Improved Button....70&10%
Stub's Pattern....50%
Combination and others....33⅓%
Heller's Farriers' Nippers, Pincers, and Tools 40&10@40&10&10%
P. S. & W. Tinners' Cutting Nippers, 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds....40%

Plumbs and Levels—

Chapin Stephens Co.:
Plumbs and Levels....30@30&10&10%
Chapin's Imp. Brass Cor 40@40&10&10%
Pocket Levels....50@30&10&10%
Level Glasses....60@60&10&10%
Disston's Plumbs and Levels....70%
Disston's Pocket Levels....70%
C. E. Jennings & Co.'s Iron....25&10%
C. E. Jennings & Co.'s Iron, Adjustable, 33⅓&10%
Stanley R. & L. Co...10&10@30&10&10%

Stanley's Duplex.....20@20&10&10%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $4.50; No. 2, $ .00; No. 3, $ .00; No. 4, $12.00..... .....50%

Points, Glaziers'—

Bulk and 1 lb. papers.. lb. 8½c@..
½-lb. papers..... lb. 9 c@..
¼-lb. papers..... lb. 9½c@..

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's..... .....25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ¼ pt. cans, ₱ doz.....$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans .. ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50 .....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ½ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt, Square.....gro. $9.00
1 qt, Round.....gro. $10.00
1½ qt. Square.....gro. 11.00
2 qt., Square..... .... gro. 13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts, each.....$1.30

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled.....40%
Tinned.....35%

Powder—

In Canisters:
Duck, 1 lb. each.....45¢
Fine Sporting, 1 lb. each.....75¢
Rifle, ½-lb. each.....15¢
Rifle, 1-lb. each.....25¢
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun	Rifle
Keg (25 lb bulk).....	$12 00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)..	14.00	17 00
Half case 12 (1 lb cans blk)	7.25	8 75

Robin Hood Shot Gun.....50&20%

Presses—Fruit and Jelly—

Enterprise Mfg. Co.....20@25%
Sensible.....33⅓%
2 qt., $2.00; 4 qt., $4.00; 10 qt., $6.00 each.

Seal Presses—

Morrill's No. 1, per doz. $20.00.....50%
Morrill's No. 2, per doz. $22 50 .....50%

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—

Cyclops.....50%
Miller's Falls, No. 3, per doz. $13.00..... 33⅓&10%
Pearson No. 1, Cyclone Spike Puller, each $57.50.....50%
Pelican, ₱ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $6.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $4.00; No. 2-D (large), $4 50; No 3-D (small) $4.00.
Smith & Hemenway Co.:
Alls.....60%
Diamond B, No. 2, ca e lots. ₱ doz $6.00
Diamond B, No. 2, case lots. ₱ doz $5.50
Eureka.....50%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15..... .....40%
Yankee.....66⅔%

Pulleys—Single Wheel—

Inch.....	*2*	*2½*	*3*
Awning, doz	*$0.55*	*.85*	*1.15*

Hay Fork, Swivel or Solid Eye..... doz., 4 in., $1.15; 5 in., $1.50

Inch	*2*	*2¼*	*2½*
Hot House.doz	*$0.70*	*.90*	*1.25*
Inch	*1¼*	*1½*	*1¾*	*2*
Sre w....doz	*$0.15*	*.19*	*.23*	*.30*
Inch	*1¼*	*2*	*2¼*	*2½*
Side.....doz	*$0.30*	*.40*	*.55*	*.65*
Inch.....	*1½*	*1¾*	*2*	*2½*
Tackle....doz	*$0.30*	*.42*	*.58*	*1.00*

Stowell's:
Ceiling or End, Anti-Friction.....60%
Dumb Waiter, Anti-Friction..60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00..... .....50%
Electric Light 60%
Slide, Anti-Friction..... 0&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ in., 13c; 2 in., 16c
Auger Mortise, no Face Plate, per doz. 1¾ in., 12c.; 2 in., 15c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.
Acme.....1¾in., 16c; 2 in., 19c
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2¼ in. ₱ doz 25¢
No. 9, 1¾ in..... ₱ doz. 20¢
Extra for Plated Finish..., ₱ doz 10¢
Extra for Anti-Friction Bronze Bushing..... ₱ doz 10¢
Grand Rapids All Steel Noiseless.... 40%
Ideal No. 13.....1¾ in.. ₱ doz.. 16¢
Niagara.....1¾ in. 16¢; 2 in. 19¢
No. 26, Troy.....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60@60&10%
Pitcher Spout.....75&10@80%
Wood.....50@50&10%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch..	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Barnes Dbl. Acting (low list).....50%
Contractors' Rubber Diaphragm N. 2 B. & L. Block Co.....$18.00
Flint & Walling's Fast Mail (low list).55%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. d. Co.....20%
Myer's Pumps, low list 50%
Myers' Power Pumps.....50%
Daisy Spray Pump.....₱ doz. $7.50
Myers' Spray Pumps.....50&10%

Punches—

Saddlers' or Drive, good..doz. 65@70¢
Spring, single tube, good quality... $1.75@2.00
Revolving (4 tubes)...doz. $4.75@5.00
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Morrill's No. 1 (A. B. C.), ₱ doz., $15.00 .50%
No. 2, ₱ doz. $22.50.....50%
No. 2, Metal, ₱ doz., $45.00.....50%
Bench Punch, each, $ 00.00 .....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches..... 55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels:

½	¾	¾	*In.*
$1.70	*$2.10*	*$3.00*	*100 feet.*

Angular for Sq. Groove Wheels:

Small	*Med.*	*Large.*	
$1.60	*1 95*	*2.70*	*100 feet.*

Sliding Door, Brnzed Wr't Iron, ft. 6½c
Sliding Door, Iron Painted....2½@3c
Sliding Door, Wrought Brass, 1⅛ in.....lb. 36c...30%
Allith Mfg. Co. Reliable Hanger Track ₱ foot .....10¢
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lance's O. N. T., ₱ 100 ft., 1 inch, $3.10; 1¼ inch, $3.90; 1½ inch, $4.85.
Lance's Standard, ₱ 100 ft.....3.75
Lawrence Bros. ..... ₱ ft. 4½¢
Lawrence Bros. New York.....3½¢
McKinney's Hinged Hanger Rail ₱ foot, lb..... 50%
McKinney's None Better.....₱ ft. 3½¢
McKinney's Standard ..... ₱ ft. 4 ¢
Myers' Stayon Track .....50&10%
Smith's Wrought Bracket, Plain.....3½¢
Smith's Special .....4½¢
Smith's Never Jump, per ft. 11¢.....50%
Smith's Plain Steel 30%
Smith's Milled Steel.....4½¢
Stowell's Cast Rail .....1½¢
Stowell's Steel Rail Plain.....25%
Stowell's Wrought Bracket, Plain....3½¢
Swett's Hylo, per ft. 11¢..... ..50&10%
Swett's P. L. B. Steel Rail, ₱ 100 ft. $3.00

Rakes—

Net Prices, Malleable Rakes:

10	*12*	*14*	*16-tooth*
Shank.....$1.50	*1.60*	*1.75*	*1.85*
Socket.....$1.65	*1.80*	*1.95*	*2.10*

Steel. August 1, 1899, List...70&5&20%
Malleable.....70&10@75&5%
Lawn Rakes, Metal Head, per doz., 20 teeth.....$3.25@3.50
24 teeth.....$3.60@3.75
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn $3.00
Jackson Lawn, 29 and 30 teeth, ₱ doz $4.00
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.45
Lawn Queen, 24-tooth, ₱ doz $3.60
Parnagon, 20 tooth, ₱ doz $2.75
Parnagon, 24-tooth, ₱ doz..... .....$3.00
Steel Garden, 14-tooth, ₱ doz.....$2.88
Malleable Garden, 14-tooth, ₱ doz..$2.00

Rasps, Horse—

Disston's..... .....75%
Heller Bros.....10&5&10&10&5%
McCaffrey's American Standard..... 60&10&5%
New Nicholson.....70&10%
See also *Files.*

Razors—

Borastic.....60 & 10%
Fox Razors, No. 42, .. ₱ doz. $20.00
Fox Razors, No. 41, .. ₱ doz. $20.00
Fox Razors, No. 82, Platina, ₱ doz. $ -25.00
Red Devil.....60%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00 .....$12.00
All other Razors..... .....40%
Safety Razors..... .....40%

Safety Razors—

New Gem, in Tin Boxes.....₱ doz $12.00
New Gem, Extra Blades .....₱ doz. $8.35
Gem Outfits (Razor, Strop, etc.) ₱ doz. $ 5.60
Complete Razor, extra Blade in Leather Case.....₱ doz. $21.00

Reels— Fishing—

Bishop's Independent Fish Reel Spooler, ₱ doz.....$30 00
Hendryx:
M 6, Q 6, A 6, B 6, M 9½, 4008, Silver Rubber Populo, Nickeled Populo, Aluminum, German Silver, Bronze, 3-0 I N, 0 6 N, 4 N to 8 PN.....33⅓%
6 RW, 102 P and RN, 202 P and PN.40%
G 9.....20%
24 N to 28 PN..... .....35&10&10%
124 N, 974 PN, 002904 PN, 1020 R and PRN, 202 PR and PR N.....50&5%
2904 N.....40&10&5%
5009 PN and N.....50%
2904 P.....50&10&5%
2904 PN.....60%
0926 N.....40&10%
02084 N.....45&12½&5%
Single Action Trout.....40&10%
986 P N, 802 and 802 N.....50&10%
Competitor, 304 and 304 PN 35%
00304 P and PN.....40&5%
Safety an I Salmon.....30%

Registers—*List Sept. 2, 1901.*

Black Jap.....
White Jap.....
Bronzed .....
Nickel Plated.....
Electro Plated.....
7&10 @8%
There is a good deal of irregularity in prices of Registers.

Registers, Cash—

Sun, No. 10, Metal Cabinet.....$30.00
Sun, No. 10, Wood Cabinet.....$25.00

Revolvers—

Single Action. .....85@90c
Double Act n, except 44 cal. $1.40@1.50
Double Action, 44 caliber. .$1.60@1.65
Automatic ....$2.85@3.10
Hammerless.....$3.25@3.60

Riddles, Grain or Sand—

16 in., per doz.....$2.75@3.00
17 in., per doz..... .....$3.00@3.25
18 in., per doz.....$3.25@3.50

Rings and Ringers—Bull Rings—

2	*2½*	*3 Inch.*
Steel.....$0 70	*0.75*	*0.80 doz.*
Copper..... 1.00	*1.10*	*1.35 doz.*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.25@4.50
Hill's Ringers, Gray Iron. doz. 55@60c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.00@5.25
Blair's Ringers....per doz. 60@65c
Brown's Rings....per gro. $5.50@5.75
Brown's Ringers..per doz. $0.75@1.00

Rivets and Burrs—

Copper.....50c&10@50c&10@£5%
Iron or Steel:
Tinners' .....75@75c&10%
Miscellaneous .....75@75c&10%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list..... 60%
Cronk's Stay..... .....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's Stay .....33⅓&5%
Stowell's Barn Door Stay.....₱ doz. $4.25

Rope—

Manila, 7-16 in. and larger, tarred or untarred...lb. 11 @12 c
Manila, ⅜-inch .... lb. 11½@12½c
Manila, ¼ & 5-16 in....lb. 12½@13 c
Manila, Hay, Hide and Bale Ropes, Medium and Coarse..... ....lb. 12 @12½c
Sisal, 7-16 in. and larger lb. 9 @10 c
Sisal, ½-inch .. .. lb. 9½@10½c
Sisal, ¼ and 5-16 Inch..lb. 10 @11 c
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse..... lb. 9 @10 c
Sisal, Tarred, Medium Lath Yarn.....lb. 8½@ 9½c
Cotton Rope:
Best ....½-in. and larger, lb. 13½c
Medium..¼-in. and larger, lb. 11 c
Com ....¼-in. and larger, lb. 9 c
Jute Rope:
Thread No. 1, ¼-in. and up, lb. 6½c
Thread No. 2, ¼-in. and up, lb. 6 c
Yarn, ¼-in. and up.. lb. 5 @5½c
Old Colony Manila Transmission Rope, ₱ lb 17½¢

Wire Rope—

Galvanized.....40&5%
Plain .....45&5%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute ....40&5%
Sisal 30%
Covert Saddlery Works. .....60&5%

Rules—

Boxwood.....60&10@60&10&5%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood..... .60@60&10%
Ivory ..... 35@35&10&10%
Miscellaneous..... 50@50&10&10%
Combination ..... 35@35&10%
Stationers'..... 10@10&10%
Lufkin's Steel..... .50&10%
Lufkin's Lumber..... .60&10%
Stanley R. & L. Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35@35&10&10%
Upson Nut Co.:
Boxwood..... .60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

—See *Stuffers or Fillers, Sausage.*

Saw Frames—See *Frames, Saw*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular..... .....50@50&10%
Band .....50&10@60%
Cross Cuts .....35&5%
Mulay, Mill and Drag .....50&10%
One-Man Saw.....40%
Wood Saws... .....40%
Hand, compass, &c.....40%
Chapin-Stephens Co.:
Turning Saws and Frames ...30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....25%
Disston's:
Circular, Solid and Inserted Tooth..30%
Band, 3 to 14 in. wide.....6%
Hand, ¼ to 2¾..... .....70%
Crosscuts.....45%
Narrow Crosscuts.....50%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods. 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 79, 77, 8.....25%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Keynole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s.:
Back Saws.....25&10%
Butcher Saws.....30&10%
Compass and Key Hole Saws.35&5&10%
Framed Wood Saws.....30&10%
Hand Saws.....30&2½&10%
Wood Saw Blades.....30&10%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace:
Circular and Mill 50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill 50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws..... .....50%
Back Saws.....25@25&7½%
Butcher Saws..... .....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....25%
Compass, Keyhole, &c .....25@25&7½%
Wood Saws.....35@35&7½%

Hack Saws—

Atkins' Hack Saw Blades A A A. ... 30%
Disston:
Concave Blades.....25%
Keystone..... .....40%
Hack Saw Frames.....30%
Pittsburg File Works, The Best.....25%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 35&5&10%
Hack Saws, Nos. 175, 180, complete. 35&5&10%
Griffin's Hack Saw Frames .. 35&5&10%
Griffin's Hack Saw Blades.....35&5&10%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades.....25%
Sterling Hack Saw Frames.....20%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scalers, Fish—

Bishop's Lightning.....₱ doz. $3.00
Covert's Saddlery Works .....60&10%

Scales—

Family, Turnbull's.....30@30&10%
Counter:
Hatch, Platform, ½ oz to 4 lbs. doz. $5.50
Two Platforms, ½ oz to 8 lbs. doz. $16
Union Platform, Plain...$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter, Candy, Ice, Postal, Computing.....50%
"The Standard" Portables.....45%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle.....doz. $2.25@2.50
Box, 2 Handle.....doz. $3.00@3.50
Ship Light, $2.50; Heavy, $4.00
Adjustable Box Scraper (S. R. & L. Co.) $6.00 .....30&30&10%
Chapin-Stephens Co., Box.....50-&50&10%

Screens, Window, and Frames—

Flyer Pattern Window Screen...60@60&5%
Maine Window Screen Frames ..40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames....60&5%
Porter's:
Fairview Window Screens ..... 60&5&60&5&2½%
Hummer Window Screens ..... 60&5&60&5&2½%
Klondike Window Screens..... 60&5&60&5&2½%
See also *Doors.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in.. $2.75@3.00 :
1¼, $3.25@3.50 : 1¼. $3.85@4.25
Bench, Wood, Beech..doz. $3.00@.50
Hand. Wood. .....50@.50&5%
R. Hiss Mfg. Co, Hand. 10%
hapin-Stephens Co., Hand.....30@30&10%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1. '99.....70@15@..%
Coach and Lag, Gimlet Point, list Oct. 1 '99.....70@10@..%
Hand Rail, list Jan. 1, '81.60@10@...%

Jack Screws—

Standard List.....75@10@80@5%
Millers Falls ..... 5@10@10%
Millers Falls, Roller.....50@10%
P, S. & W.....50@50@10%
Sargent..... .....70@10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@5%@10%
Flat or Round Head, Brass50@50@1%

Set and Cap—

Set (Iron or Steel) 70%
Sq. Hd. Cap.. .....65%
Hex. Hd. Cap 65%
Hd. or Fillister Hd. Cap 60%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts :
Flat Head, Iron.....87½@10@...%
Round Head, Iron.....85@10@....%
Flat Head, Brass .....85@10@....%
Round Head, Brass.. .80@10@....%
Flat Head, Bronze....77½@10@...%
Round Head, Bronze.....75@10@...%
Drive Screws.....87½@10%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Per doz.
Clipper Pattern, Grass...$4.50@$5.00
Full Polished Clipper.....$5.0 @$5.50
Grain .....$7.00@$7.50
Clipper, Grain.....$7.75@$8.25
Weed and Bush.....$4.75@$5.00

Seeders— Raisin—

Enterprise..... .....25@30%

Sets— Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdle..10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools .. doz. $2.50@2.60
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H'dls.. Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders .....30&10%
Millers Falls Adj. Tool H'dls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50 ; No. 2 $4.00; No. 3, $5.50.....30@30&10&10%

Garden Tool Sets—

Ft. Wayne Combination, Three Pieces, Hoe, Rake and Shovel.....₱ doz. sets.....$9.00

Nail—

Square.....*per gro. $2.25@2.50*
Round, Blk. and Pol., assorted..... *gro. $1.80@2.50*
Octagon.....*gro. $4.00@4.25*
Knurled, Good.....*gro. $5.75@6.00*
Buck Brothers.....27½%
Common's Diamond Point, ₱ gr. $13..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt. per gro. $7.50
Snell's Knurled, Cup Pt....per gro $7.50

Rivet—

Regular list.....70¢10@7%

Saw—

Aiken's:
Genuine .....50&10%
Imitation .....50&10%
Atkin's.:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....30%
Spring Hammer.....40%
Disston's Star and Monarch.....25%
Morrill's No. 1, $1.00.....50%
Nos. 3 and 4, Cross Cut, $20.63.....50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.75.....50%
No. 1 Old Style, $10.00.....50%
Giant Royal, Cross Cut .....₱ doz. $9.00
Royal, Hand. .....₱ doz. $5.40
Taintor Positive, ₱ doz. $18 .....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70%

Shaves Spoke—

Iron.....*doz. $1.00@1.15*
Wood.....*doz. $1.65@2.25*
Bailey's (Stanley R. & L. Co.) .....50&50&10&10%
Chapin-Stephens Co .....50@5%&10&10%
Goodell's, ₱ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good.....	*$13.00*	*15.00*	*17.00 gro.*
Cheap....	*$2.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@.70@10%
" *Nickel*.....60@60@10%
Fair qual. Jap.....80@80@5%
" *Nickel*.....75@75@10%
Tailors' Shears.....40@40@10%
Acme Cast Shears.....40@40&5%
Geneva.....60%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge .....1900 list 45%
Wilkinson's Pruning.....40%
Wilkinson's Sheep .....1900 list. 25%

Tinners' Snips—

Steel Blades .....20¢&5@20¢10
Steel Laid Blades.....40¢10@50%
Forged Handles, Steel Blades, Berlin .....40@40&10%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 inch .....40&7½&10%
Niagara Snips 40%
P., S. & W. Co. 20%

Pruning Shears and Tools—

Cronk's Grape Shears 33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00 .....25%
Disston's Pruning Hook, ₱ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....40@40&5%
Orange Shears.....50&10@50&20%
Grape .....4&10@50%
Tree Pruners 75%
P., S. & W. Co. 33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction 50%
Patent Roller Hatfield's, Sargent's list, ...30&10%
Reading .....7&10@75%
R. & E. list.....33⅓%
Sargent's list..... .....50&10%
Wrightsville Hatfield Pattern.....30%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list..... .....50&10%

Shells— Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge .. 65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, Magic 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, New Victor, Repeater, Yellow Rival, 10, 12, 13 and 20 gauge.....5%
Climax, Union, League, New Rival, 10 and 12 gauge.....25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge (87.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓&5%
Robin Hood, Low Brass.....30&10%
Robin Hood, High Brass.....30&10%

Shells, Loaded—

Loaded with Black Powder 40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....50¢10¢10%
Robin Hood, Low Brass.....50%
Robin Hood, High Brass.....50&10&5%

Shoes Horse, Mule, &c.—

F. o. b., Pittsburg:
Iron.....*per keg $3.85*
Steel.....*per keg 3.60*
Barden's, all sizes, ₱ keg.....$3.90

Shot—

Drop, up to B, 25-lb. bag.....$1.40
Drop, B and larger, per 25-lb. bag$1.65
Buck, 25-lb. bag.....$1.65
Chilled, 25 lb bag.....$1.65
Dust Shot, 25-lb. bag.....$2.00

Shovels and Spades—

Association List, Nov. 15, 1902....40%

Sieves and Sifters—

Hunter's Imitation, gro. $11.00@11.50
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

National Mfg. Co.:
Victor.....per gro. $12.00
Surprise.....per gro. $11.00
No Name.....per gro. $11.00
Shaker (Barber's Pat.) Flour Sifters, ₱ doz., $2.00.....90%

Sieves, Tin Rim—

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Black, full size	*$1.30*	*1.25*	*1.30*	*1.35*
Plated, full size	*$1.30*	*1.35*	*1.50*	*1.45*
Black, scant	*$0.95*		*1.00*	*1.05*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....*$0.65@0 75*
Mesh 20, Nested, doz..... .75@ .85
Mesh 24, Nested, doz ..... .90@1.00

Sinks—

Cast Iron—

Standard list.....60@60¢10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Skeins Wagon—

Cast Iron.....70@70¢10%
Malleable Iron.....40¢10@50%
Steel.....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....45%
Noiseless Slates.....60¢& tens &5%
Wire Bound.....40%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling No. 10, $2.00.....33⅓%

Snaps, Harness—

German.....40@40¢10%
Covert Mfg. Co.:
Derby.....30&5&2%
High Grade.....45%
Jockey.....30&10%
Trojan.....45%
Yankee.....30&5&2%
Yankee, Roller.....30&5&2%
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
Oneida Community :
Solid Steel.....60&5%
Solid Swivel.....60%
Sargent's Patent Guarded .....66⅔&10%

Snaths—

Scythe.....50@.50&10%

Snips, Tinners'—See *Shears*

Spoons and Forks—

Silver Plated—

Good Quality.....50¢10@60¢10¢5%
Cheap..... ..50@60¢10%
International Silver Co.
1847 Rogers Bros. and Rogers & Hamilton.....40&10%
Rogers & Bro., William Rogers Eagle Brand..... .....30&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....40&10%

Miscellaneous—

German Silver.....60@60&10%
Cattaraugus Cutlery Co.:
Yukon Silver.....50%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 1.&10%

Tinned Iron—

Teas.....*per gro. 45@5.4c*
Tables..... *per gro. 90c@$1.00*

Springs— Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in......₱ doz. $1.10
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider :
Black or ⅛ Bright, lb.....5¼c
Bright, lb.....5½c
Painted Seat Springs :
1½ x 2x 26 per pr.....50@55c
1½ x 2 x 28 per pr. .....60@65c
1½ x 3 x 28 and narrower, per pr. 80@85c

Sprinklers, Lawn—

Enterprise.....25@29%
Macksey.....₱ doz. $1.80
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated.... List Jan. 5, 1900.
Steel and Iron..... .....70¢10%
Rosewood tidl Try Square and T-Bevels .....60¢10¢10¢5%
Iron Hdl. Try Squares and T-Bevels. 50¢10¢10¢10¢5%
Disston's Try Sq. and T-Bevels.....5%
Winterbottom's Try and Miter ..... 10&10%

Squeezers— Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50 : No. 1, $6.25@$6.50.
Wood, Porcelain Lined, Cheap.....*doz. $2.00@2.75*
Good Grade.....*doz. $2.00@$3.50*
Tinned Iron.....*doz. $0.75@1.25*
Iron, Porcelain Lined doz. $2.90@3.25

Staples—

Barbed Blind.....*lb. 6@9½c*
Electricians', Association list, ...80¢10¢10&20%
Fence Staples, See Trade Report.
Galvanized, 15c less than Barb Wire Polished. 20c less than Barb Wire.
Poultry Netting, Staples....*per lb.. 2¼@2½c*
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's..... .....30%
Foster Bros'.....30%
Hartzell Cutlery Co..... .....60&5%
C. & A. Hoffmann's.....40%

Steelyards..... *25¢1 @30¢10%*

Stocks and Dies—

Blacksmiths'.....40¢10@50%
Curtis Reversible Ratchet Die Stock.25%
Derby Screw Plates.....25%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25&30%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 inch, $8.00 per gro., 12 inch, $10.50
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₱ gro. $12.00
Lamoille S. S .....₱ gro. $11.00
White Mountain S. S....₱ gro. $9.00
Green Mountain S. S....₱ gro. $6.00
Extra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S..₱ gro. $7.00
No. 2 Indian Pond S. S..₱ gro. $4.50
Leader red End S. S....₱ gro $4.50
Balance of 1901 list 33⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co. 1901 list:
Gem Corundum Oil, Double Grit.....50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones.....50%
Pike Mfg. Co. 1901 list:
Arkansas Stone, No. 1, 3 to 5½ in. $2.80
Arkansas Stone, No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 .....$4.00
Lily White Washita 4 to 8 in. ....60¢
Rosy Red Washita, 4 to 8 in. ....60¢
Washita Stone, Extra, 4 to 8 in..50¢
Washita Stone, No. 1, 4 to 8 in..40¢
Washita Stone, No. 2, 4 to 8 in..30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
India Oil Stones (entire list) 33⅓%
Hindostan No. 1, Regular.... ₱ lb 8¢
Hindostan No. 1 Small..... ₱ lb 10¢
Axe Stones (all kinds) .....
Turkey Oil Stones, ex. 5 to 8 in. ₱ lb 8¢
Queer Creek Stones, 4 to 8 in.....30¢
Queer Creek Slips.....40¢
Sand Stone.....2¢
Belgian, German and Swaty Razor Hones.....50¢
Natural Grit Carving Knife Hones, ₱ doz.....$3.00
Quick Edge Pocket Knife Hones, ₱ doz 3.00
Mounted Kitchen Sand Stone, doz.....1.50

Stoners— Cherry—

Enterprise..... .....25@30%

Stops Bench—

Millers Falls..... .....15&10%
Morrill's...₱ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50..... .....50%

Door—

Chapin-Stephens Co..... 60&60&10%

Plane—

Chapin-Stephens Co.....3%

Straps— Box—

Cary's Universal, case lots.....20&10%

Hame—

Covert's Saddlery Works.....10&10%

Stretches, Carpet—

Cast Iron, Steel Points ...doz. 55@60c
Socket.....*doz. $1.75*

Stuffers, Sausage—

Enterprise Mfg. Co.....25&25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Supports, Porch—

Hoffman's Porch Supports....₱ doz. 25¢

Sweepers, Carpet—

National Sweeper Co.:	Per doz.
Marion, Roller Bearing, regular finishes, full Nickel	$24.00
Marion Queen, Roller Bearing, Fancy Veneers, full Nickel	$27.00
Monarch, Roller Bearing, Nickel	$22.00
Monarch, Roller Bearing, Japan	$22.00
Marion Queen, Roller Bearing Regular Finishes, full Nickel	$24.00
Transparent, Roller Bearing, Pedestal Glass Top, Nickel	$32.00
Monarch Extra, Roller Bearing, (17-inch case), Nickel	$36.00
Monarch Extra, Roller Bearing (17-inch case), Japanned	$33.00
Perpetual, Regular Bearings, Nickel	$20.00
Perpetual, Regular Bearings, Japan	$18.00

NOTE.—*Discount of 50c per dozen on three-dozen lots. Discount of $1 per dozen on five-dozen lots.*

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American .....
90¢25&5@.....%
American Cut Tacks.90¢20&5@.....%
Swedes Iron Tacks...90¢20 &5@....%
Swedes Upholsterers' Tacks..... 90¢5&5&5@....%
Gimp Tacks.....90¢5&5@.....%
Lace Tacks.....80¢10@.....%
Trimmers' Tacks..90¢20@10¢5@....%
Looking Glass Tacks....70¢10@.....%
Bill Posters' and Railroad Tacks.... 90¢5&5@....%
Hungarian Nails ...80¢20&5@....%
Common and Patent Brads....80¢10%
Trunk and Clout Nails..80¢5@.....%

NOTE.—*The above prices are for* straight Weights.* *An extra 5% is given* Star Weights** *and an extra 10&5% on* Standard Weights.***

Miscellaneous—

Double Point Tacks.....*90 and 5 tens*
Steel Wire Brads, R. & E. Mfg. Co.'s list.....*50¢10@60%*
See also *Nails, Wire.*

Tanks, Oil—

	Each.
Emerald, S. S. & Co.....30-gal	$3.40
Emerald, S. S. & Co.....60-gal.	$4.25
Queen City S. S. & Co., 30-gal.	$3.65
Queen City S. S. & Co., 60-gal.	$4.50

Tapes, Measuring—

American Asses' Skin.....40¢10@50%
Patent Leather.....25@30¢5%
Steel.....50@40¢5%
Chesterman's.....35@.5¢5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899..... .....35%
Lufkin's Steel.....33⅓&35%
Lufkin's Metallic..... .30@30&5%

Teeth Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger, per 100 lbs., $3.00

Thermometers—

Tin Case.....80¢10@80¢10¢5%

Ties, Bale—Steel Wire.

Single Loop..... .....8¢2½
Monitor, Cross Head, Etc 70%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6½ in. ₱ 1000, $10.00
Galv. Steel 5-32 x 8½ in. ₱ 1000, $11.00
Galv. Steel 5-32 x 11½ in. ₱ 1000 $12.00
Galv. Steel 5-32 x 15½ in. ₱ 1000 $14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....20&10%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tools— Coopers'—
T. & I. J. White .....90@20&5%
Hay—
Rivers' Hay Tools 50%
Saw—
Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%
Ship—
T. & I. J. White.....25%
Transom Lifters—
See Lifters, Transom.
Traps— Fly—
Balloon, Globe or Acme..... doz. $1.15@1.35; gro. $11.50@12.00
Harper, Champion or Paragon..... doz. $1.25@1.50; gro. $13.00@13.50
Game—
Oneida Pattern.....80@30&5%
Newhouse.....45@45&5%
Hawley & Norton.....65&5@65&10%
Victor (Oneida Pattern).....75@75&5%
Star (Blake Pattern).....60&5@60&10%
Mouse and Rat—
Mouse, Wood, Choker, doz. holes..... 8½@9c
Mouse, Round or Square Wire..... doz. 85@90c
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 7 $2.75 doz.
No. 5, Mouse, ₱ doz. $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00
No. 2, ₱ gr. $30.00; Mouse, No. 3, $18.00 .....50%
J. M Mast Mfg. Co.: Per gro.

	Mouse.	Rat.
Blizzard	No. 12, $3.00	No. 1, $9.50
Old Nick	No. 20, 2.22	No. 2, 8.40
Joker	No. 5, 2.10	No. 3, 5.40

Imp'd Snap Shot, Mouse, per gro., 2 hole, $2.40.
Imp'd Snap Shot, Mouse, per gro., 4 hole, $4.20.
Trimmers Spoke—
Bonney's Nos. 1 and 2.....40%
Wood's E I.....50%
Trowels—
Disston Brick and Point'ng.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ₱ gro. $5.00
Kohler's Steel Garden Trowels, 6 in. ₱ gro. $6.00
Never-Break Steel Garden Trowels, gro. $6.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough&McParlin,Pl'st'ring.....25%
Trucks, Warehouse, &c.—
B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....per doz. $16.00
Grocery.....per doz. $15.00
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks.....₱ doz. $18.50
Tubs, Wash—

	No. 1	2	3
Galvanized, per doz.	*$4.75*	*5.25*	*6.00*

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz.	$5.25	6.00	6.75	6.50	7.00	8.00

Twine—Miscellaneous—

Flax Twine—	*BC*	*B.*
No. 9, ¼ and ½-lb. Balls	*21½c*	*23½c*
No. 12, ¼ and ½ lb. balls	*17½c*	*19½c*
No. 18, ¼ and ½-lb. Balls	*15½c*	*17½c*
No. 24, ¼ and ½-lb. Balls	*15 c*	*17 c*
No. 36, ¼ and ½-lb. Balls	*14½c*	*16½c*

Chalk Line, Cotton, ½-lb Balls..... 22@22½c
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....8c
Cotton Wrapping 5 Balls to lb ... according to quality..... 11c@17c
American 2-Ply Hemp, ¼ and ½-lb. Balls..... 13@14c
American 3 Ply Hemp, 1-lb. Balls .. 13@14c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....9c
India 3-Ply Hemp, 1-lb. Balls.....8c
India 3-Ply Hemp, 1½-lb. Balls.....7c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls... 8@9c
Mason Line, Linen, ½-lb. Balls...45c
No. 264 Mattress, ¼ and ½-lb. Balls 37c
Wool, 3 to 6 ply.....5@5½c
Binder—
Cents per lb

Sisal	10¼
Standard	11¼
Standard Manila (550 ft.)	11
Manila (600 ft.)	12
Pure Manila (650 ft.)	12¾

F. o. b. Eastern Mill. Carload lots ¼ cent less.
Vises—
Solid Box..... 50c@10@50&10@5
Parallel—
Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40%
Columbian Hdw Co.....40%
Emmert Universal:
Pattern Makers' No. 1.....$15.00 net
Pattern Makers' No. 2.....$13.00 net
Machinist and Tool Makers'.....$15.00 net
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Keystone.....65&5%
Lewis Tool Co.....20@30%
Merrill's.....20%
Miller's Falls.....50&10&10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Smith & Hemenway Co.:
Machinists.....40%
Jewelers.....33⅓%
Snedliker's X. L.....33⅓%
Stephens'.....33⅓%
Saw Filers'—
Bonney's, No. 1, $13; No. 3, $16 .....50&5%
Disston's D 3 Clamp and Guide, ₱ doz $30.....25%
Reading.....60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%
Wood Workers'—
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.
Miscellaneous—
Bignall & Keeler Combination Pipe Vise.....80%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%
Wads—Price Per M.

	Dis
B. E., 11 up	60c
B. E., 9 and 10	70c
B. E., 8	80c
B. E., 7	80c
P. E., 11 up	$1.00
P. E., 9 and 10	1.25
P. E., 8	1.50
P. E., 7	1.50
Ely's B. E., 11 and larger	$1.70@1.75
Ely's P. E., 12 to 20	$3.00@3.25

Ware Hollow—
Cast Iron, Hollow—
Stove Hollow Ware:
Ground.....50c&10@60%
Unground.....60c&5@65%
White Enameled Ware:
Maslin Kettles.....70%
Covered Ware:
Tinned and Turned.....40%
Enameled.....50%
See also *Pots Glue.*
Enameled—
Agate Nickel Steel Ware, list Nov. 1, '01.....50&10%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%
Tea Kettles—
Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.
Avery Spiders & Griddles .....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles.....65&5%
Never Break Kettles.....60%
Solid Steel Spiders & Griddles. ....65&5%
Solid Steel Kettles.....60%
Warmers, Foot—
Pike Mfg. Co., Soapstone.....40@40&10%
Washboards—
Solid Zinc: ₱ doz
Crescent, family size, beat frame..$3.00
Red Star, family size, stationary protector.....$3.00
Double Zinc Surface:
Saginaw Globe family size, stationary protector.....$2.65
Cadle Cross, family size, stationary protector.....$2.90
Single Zinc Surface:
Salad, family size, open back perforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.25
Brass Surface:
Brass King, Single Surface, open back.....$3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00
Washers—
Leather, Axle—
Solid.....85c@1.00@85c@10@1.00@1.25
Patent.....85c@1.00@85c@20%
Coil: ⅜ *1* 1¼ 1¼ *Inch,*
5c 10c 11c 13c per 100
Iron or Steel—
Size bolt ... 5-16 ⅜ ½ ⅝ ¾
Washers....$6.80 5.50 4.60 4.50 4.25
In lots less than one keg add ½c per lb., 5-lb. boxes add ½c to list.
Cast Washers—
Over ½ inch, barrel lots, per lb..... 1¾@2c
Wedges—
Oil Finish.....lb. 2.90@3.10c
Weights—
Hitching—
Covert's Saddlery Works.....60&10%
Sash—
Per ton, f. o. b. factory:
Eastern District.....$26.00
Western, Central and Southern Districts.....$27.00
Wheels, Weil—
8-in., $1.60@1.80; 10-in., $2.00@2.25; 12-in., $2.15@2.65; 14-in., $4.00@5.25
Wire and Wire Goods—
Bright and Annealed:
6 to 9.....72½c@5@72½&10%
10 to 18.....72½c@10@72½c@10&5%
19 to 26.....75c@1.00@2½@75c@10@72½&5%
27 to 36.....75c@10c@72½@80c@2½&5%
Galvanized:
6 to 18.....70c@70c&5%
19 to 26.....72½c@5@72½c@10%
27 to 36.....72½c@10@72½c@10&5%
Coppered:
6 to 9.....70c@5@70c@10%
10 to 18.....70c@10@70c@10&5%
19 to 26.....75c@1.00@75c@10@72½%
27 to 36.....75c@10@75c@10@5%
Tinned:
6 to 14.....75c@75c@72½%
15 to 18.....72½c@ 70@75%
19 to 26.....70c@70@75c@3%
27 to 36.....70c@70c@5%
Annealed Wire on Spools...70c@70c@5%
Brass and Copper Wire on Spools, 60@60@5%
Brass, list Feb. 26, '96.....20@30%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to £. 50%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*
Bright Wire Goods—
List April 1, 1901.....85c@10c@10@90%
Wire Cloth and Netting—
Galvanized Wire Netting 80@80c@10%
Painted Screen Cloth per 100 ft. $1.15
Light Hardware Grade
2-8 Mesh, Plain (8c. list) sq. ft... 1¾@2c
2-8 Mesh, Galv. (8c. list) sq. ft..2½@2¾c
Wire, Barb—See *Trade Report.*
Wrenches—
Agricultural .....80@c80@10%
Baxter Pat'n S Wrenches 70@75c@75c@10%
Drop Forged S.....45c@75c@75c
Acme .....60@10%
Alligator.....70%
Alligator Pattern 75%
Bull Dog.....70%
Bemis & Call's:
Adjustable S .....35&5%
Adjustable S Pipe.....40%
Brigg's Pattern.....30&10%
Combination Black.....40&5%
Combination Bright.....40%
Cylinder or Gas Pipe 55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Boardman's.....33⅓%
Coes' Genuine .....40&10&5&5%
Coes' "Mechanics'".....40&10&10&5&5%
Donohue's Engineer.....40&15%
Daisy Auto .....50&5@50&10%
Eagle.....50&10%
Elgin Wrenches.....10%
Elgin Monkey Wrench Pipe Jaws....30%
Gem Pocket 30%
Hercules.....70%
W. & B. Machinist:
Case lots.....50&10%
Less than case lots.....50&5%
Improved Pipe (W. & B.).....40%
Solid Handles, P. S. & W .... 50@50&5%
Stillson 65%
Triumph .....60&10%
Vulcan Chain.....30%
Fruit Jar—
Triumph Fruit Can Wrenches, ₱ gro. $19.20
Syrup Cap Wrenches.....₱ gro. 88.00
T & B Fruit Jar Wrenches, ₱ gro $16.50
T & B Fruit Jar Holders ₱ gro. $30.00
Wrought Goods—
Staples, Hooks, &c., list March 17 '02.....50@50c&5%
Yokes Neck—
Covert Saddlery Works, Trimmed.....70%
Covert Saddlery Works, Neck Yoke Centers.....70%
Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters'.. list net
Zinc—
Sheet.....lb 7 @7¼c

PAINTS, OILS AND COLORS —Wholesale Prices.

White Lead, Zinc, &c.
Lead, English white, In Oil... 7 @ 9¾
Lead, American White, in Oil:
Lots of 500 ₱ or over.....@ 6¼
Lots less than 500 ₱.....@ 7¼
Lead, White, in oil, 25 ₱ tin pails, add to keg price.....@ ⅛
Lead, White, in oil, 12½ ₱ tin pails, add to keg price.....@ 1
Lead, White, in oil, 1 to 5 ₱ assorted tins, add to keg price...@ 1½
Lead, American, Terms: For lots 12 tons and over ¼c rebate; an 1 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net.
Lead White, Dry in bbls.....5¾@ 6¼
Zinc, American, dry..... ₱ ₱ 4½@ 4¾
Zinc, Paris, Red Seal, dry.....@ 8½
Zinc, Paris, Green Seal, dry.....@ 9¼
Zinc, Antwerp Red Seal, dry.....@ 7½
Zinc, Antwerp, Green seal, dry ...@ 8½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12½
Lots of less than 1 ton.....12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11@11½
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.
Dry Colors.
Black, Carbon.....₱ ₱ 6 @ 10
Black, Drop, Amer.....4 @ 7
Black, Drop, Eng.....7 @15
Black, Ivory.....15 @21
Lamp, Com.....4½@ 6
Blue, Celestial.....₱ ₱ 4 @ 6
Blue, Chinese.....29 @31
Blue, Prussian.....27 @30
Blue, Ultramarine.....3½@15
Brown, Spanish.....1½@ 1
Brown, Vandyke, Amer.....1¾@ 2½
Brown, Vandyke, Foreign.....2½@ 3½
Carmine, No. 40.....₱ ₱ $2.50@2.50
Green, Chrome, ordinary.....3 @ 6
Green, Chrome, pure.....19 @26
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ₱ or over.....@ 6¾
Lots less than 500 ₱.....@ 7¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ₱ or over.....@ 6¾
Lots less than 500 ₱.....@ 7¼
Ocher, French Washed.....5 @ 7
Ocher, Dutch Washed.....5 @ 7
Ocher, American.....₱ ton $10.00@15.00
Orange Mineral, English..₱ ₱ 8½@ 9½
Orange Mineral, French.....10½@11¼
Orange Mineral, German.....8½@9½
Orange Mineral, American.....8¼@ 8½
Red, Indian, English.....4½@ 8½
Red, Indian, American.....3 @ 3¼
Red, Turkey, English.....4 @ 6
Red, Tuscan, English.....7 @10
Red, Venetian, Amer., ₱ 100 ₱. .50@1.50
Red Venetian, English.₱ 100 ₱. 1.50@1.75
Sienna, Italian, Burnt and Powdered.....₱ ₱ 3½@ 7½
Sienna, Ital., Raw, Powd.....3½@ 7½
Sienna, American, Raw.....1½@ 2
Sienna, American, Burnt and Powdered.....₱ ₱ 1½@ 2
Talc, French.....₱ 100 ₱ $1.25@1.50
Talc, American.....90 @1.10
Terra Alba, French, ₱ 100 ₱. .95 @1.00
Terra Alba, English.....95 @1.00
Terra Alba, American No. 1.....65 @85
Terra Alba, American No. 2.....45 @50
Umber, Turkey, Bnt. & Pow. ₱ ₱ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer.....1½@ 2
Umber, Raw, Amer.....1½@ 2
Yellow, Chrome.....11 @14
Vermilion, American Lead.....10 @40
Vermilion, Quicksilver, bulk..@71
Vermilion, Quicksilver, bags.....@71
Vermilion, English, Import..80 @95
Vermilion Chinese.....$1.05@1.20
Colors in Oil.
Black, Lampblack.....12 @14
Blue, Chinese.....36 @40
Blue, Prussia.....32 @33
Blue, Ultramarine.....13 @16
Brown, Vandyke.....11 @14
Green, Chrome.....10 @15
Green, Paris.....@24
Sienna, Raw.....12 @15
Sienna, Burnt.....13 @15
Umber, Raw.....11 @14
Umber, Burnt.....11 @14
Miscellaneous.
Barytes, Foreign, ₱ ton....$19.00@21.00
Barytes, Amer. floated.....18.50@20.00
Barytes, Crude, No. 1.....9.00@10.00
Chalk, in bulk.....₱ ton 3.00@ 3.25
Chalk, in bbls.....₱ 100 ₱ .30@ .35
China Clay, English..₱ ton 10.50@17.00
Cobalt, Oxide.....₱ 100 ₱ 2.25@ 2.50
Whiting, Common ₱ 100 ₱ .45@ .55
Whiting, Gilders.....62½@ .68
Whiting, extra Gilders'.....65@ .72
Putty.
In bladders.....13½@2½
In bulk.....11½@2
In cans 1 ₱ to 5 ₱.....2½@4½
In cans 12½ ₱ to 25 ₱.....1½@2½
Spirits Turpentine.
In Southern bbls.....53 @53½
In machine bbls.....53½@54
Clue.
Cabinet.....₱ ₱ 11½@16
Extra White.....18 @23
French.....12 @40
Irish.....13½@16
Low Grade.....9 @12
Medium White.....14½@16½
Animal, Fish and Vegetable Oils.
Linseed, City, raw.....₱ gal..44 @ 45
Linseed, City, boiled.....45 @49
Linseed, State and West'n, raw 42 @ ..
Linseed, raw Calcutta see l.....75 @ ..
Lard, Prime.....79 @80
Lard, Extra No. 1.....60 @62
Lard, No. 2.....46 @47
Cotton-seed, Crude, f. o. b. mills..31 @33
Cotton-seed, Summer Yellow, prime.....42½@43½
Cotton-seed Summer Yellow, off grades.....38 @38½
Sperm, Crude.....@ ..
Sperm, Natural Spring.....67 @68
Sperm, Bleached Spring.....68 @69
Sperm, Natural Winter.....72 @74
Sperm, Bleached Winter.....75 @77
Tallow, Prime.....58 @60
Whale, Crude.....@ ..
Whale, Natural Winter.....46 @47
Whale Bleached Winter.....48 @49
Menhaden, Brown, Strained..30 @31
Menhaden, Light Strained....32 @33
Menhaden, Bleached Winter..34 @35
Menhaden, Ex Bleached Winter 36 @37
Cocoanut, Ceylon.....5½@5¾
Cocoanut, Cochin.....5¾@6¼
Cod, Domestic.....33 @37
Cod, Newfoundland.....30 @ 0
Red Oil'ne.....46 @47
Red Saponified.....₱ ₱ 5 @ 5½
Olive, Italian, bbls.....54 @ 60
Neatsfoot, prime.....57 @58
Palm, prime, Lagos.....₱ ₱ 5½@ 5
Mineral Oils.
Black, 20 gravity, 25@30 cold test.....₱ gal. 13 @14
Black, 29 gravity, 15 cold test. 13½@14½
Black, summer.....12½@13½
Cylinder, light filtered.....20½@21½
Cylinder, dark filtered.....18½@19½
Paraffine, 003-907 gravity..... 15 @15½
Paraffine, 903 gravity..... 14 @14½
Paraffine, 883 gravity.....11½@12
Paraffine, red, No. 1..... 15 @15½
In small lots ½c advance.

CURRENT METAL PRICES.

MAY 27, 1903.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:	
1 to 1¾ in. round and square	₩ lb. @2.20¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb. @2.20¢
1½ to 4 in. x ¼ to 5-16	₩ lb. @2.10¢
Rods—⅜ and 11-16 round and square	₩ lb. @2.40¢
Angles:	Cts ₩ lb.
3 in x ¼ in. and larger	2.30¢
3 in. x 3-16 in and ⅛ in	2.35¢
1½ to 2½ in. x ⅛ in	2.35¢
1½ to 2¾ in. x 3-16 in and thicker	2.30¢
1 to 1¼ in. x 3-16 in	2.35¢
1 to 1¼ x ⅛ in	2.40¢
⅞ x ⅛ in	2.55¢
¾ x ⅛ in	2.65¢
⅝ x ⅛ in	3.45¢
½ x 3-32 in	3.95¢
Tees:	
1 in	2.80¢
1¼ in	2.60¢
1½ in, and larger	2.50¢
Beams	3.50¢@3.00¢
Channels, 3 in. and larger	2.50¢@3.00¢
Bands—1½ to 6 x 3-16 to No. 8	₩ lb. 2.40¢
"Burden's Best" Iron, base price	₩ lb. 3.05¢
Burden's "H. B. & S. Iron, base price	₩ lb. 2.85¢
"Ulster"	₩ lb. 3.15¢
Norway Bars	3 75@4.25¢
Norway Shapes	4.00@4.50¢

Merchant Steel from Store—

	per ₩ lb.
Bessemer Machinery	2.10¢
Toe Calk, Tire and Sleigh Shoe	3.50¢@3.00¢
Best Cast Steel, base price in small lots	7¢

Soft Steel Sheets—

¼ inch	2.50¢	No. 14	2.70¢
3-16 inch	2.50¢	No. 16	2.80¢
No. 8	2.50¢	No. 18	2.90¢
No. 10	2.50¢	No. 20	3.00¢
No. 12	2.60¢	No. 22	3.10¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel	G. R. Cleaned
Nos. 14 to 16	₩ lb. 2.90	3.0 ¢
Nos. 18 to 21	₩ lb. 3.00	3.10¢
Nos. 22 to 24	₩ lb. 3.10	3.2 ¢
Nos. 25 and 26	₩ lb. 3.20	3.3 ¢
No. 27	₩ lb. 3.30	3.40¢
No. 28	₩ lb. 3.4	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ lb. 11¾@14¢
Patent Planished	₩ lb. A, 10¢; B, 9¢, net

Galvanized.

Nos. 14 to 16	₩ lb. 3.24¢
Nos. 18 to 20	₩ lb. 3.31¢
Nos. 22 to 24	₩ lb. 3.38¢
No. 26	₩ lb. 4.05¢
No. 27	₩ lb. 4.32¢
No. 28	₩ lb. 4.59¢
No. 30	₩ lb. 5.67¢

No. 20 and lighter, 36 inches wide, 25¢ higher.

Foreign Steel from Store—

Best Cast	₩ lb. 15 ¢
Extra Cast	₩ lb. 18@20 ¢
Swaged, Cast	₩ lb. 16 ¢
Best Double Shear	₩ lb. 13 ¢
Blister, 1st quality	₩ lb. 11 ¢
German Steel, Best	₩ lb. 10 ¢
2d quality	₩ lb. 9 ¢
3d quality	₩ lb. 8 ¢
Sheet Cast Steel, 1st quality	₩ lb. 15 ¢
2d quality	₩ lb. 14 ¢
3d quality	₩ lb. 12 ¢
R. Mushet's "Special"	₩ lb. 46 ¢
" " Annealed	₩ lb. 75 ¢
" " "Titanic"	₩ lb. 19 ¢
Hobson's Choice XX Extra Best	₩ lb. 35 ¢
Jessop Self Hardening	₩ lb. 45 ¢
Seamans' "Nelson" Steel	₩ lb. 40 ¢
Hobson's "Soho" Special Self-Hardening	₩ lb. 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per ₩ lb.
Banca, Pigs	31 @31¼¢
Straits, Pigs	30¾@31 ¢
Straits in Bars	31⅛@31¾¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$8.75
IX, 14 x 20	8.25
Melyn Grade:	
IC, 14 x 20	6.50
IX, 14 x 20	7.75
Allaway Grade:	
IC, 14 x 20	5.50
IX, 14 x 20	6.63

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 108 lb.	$4.70@4.80
IX, 14 x 20	5.00@5.25

American Terne Plates—

IC, 20 x 28	$9.50
IX, 20 x 28	11.50

Copper—

Duty: Pig, Bar and Ingot and Old Copper free. Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	15½¢
Castle	15 ¢

Sheet and Bolt—

March 12, 1903.

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, sole sheet, 30 x 60 usual heavier.	32 oz. to 64 oz. 25 to 50 lb.	24 oz. to 32 oz. 18¾ to 25 lb.	16 oz. to 24 oz. 12½ to 18¾ lb.	14 oz. and 15 oz. 11 to 12½ lb.	12 oz. and 13 oz. 9½ to 11 lb.	10 oz. and 11 oz. 7½ to 9½ lb.	8 oz. and 9 oz. 6¼ to 7¼ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	20	21	21	21	22	23	24	27	30
30	96	72	20	21	21	21	22	24	27	30	
30	.....	96	20	21	21	21	23	27			
36	72	.....	20	21	21	21	23	25	28	31	
36	96	72	20	21	21	21	23	27	30		
36	120	96	20	21	21	22	24				
36	.....	120	20	21	20	23					
48	72	.....	20	21	20	23	25	28	31		
48	96	72	20	21	20	24	26	29			
48	120	96	21	21	23	25	29				
48	.....	120	21	22	24	27					
60	72	.....	20	21	22	24	27	32			
60	96	72	20	21	23	25	30				
60	120	96	20	22	24	27					
60	.....	12	21	23	25	29					
72	96	.....	20	22	24	29					
72	120	96	20	23	26	31					
72	.....	120	21	24	29						
108	96	.....	21	24	27						
108	120	96	22	25	28						
108	....	120	23	26	30						
wider than 108	132	.....	24	27							
	.....	132	25	26							

Rolled Round Copper, ¾ inch diameter and over, ₩ lb. 20¢.

Circles, Segments and Pattern Sheets, 3¢ ₩ lb. advance over price of Sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb. over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb. over the foregoing prices.

All Polished Copper, 20 in. wide and under 1¢ ₩ lb. advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ lb. advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb. more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb.	26¢
12 oz. and up to 14 oz. to square foot, ₩ lb.	26¢
10 oz. and up to 12 oz., ₩ lb.	27¢
Lighter than 10 oz., ₩ lb.	28¢

Circles less than 8 in. diameter, 2¢ ₩ lb. additional.

Circles over 13 in. diameter are not classed as Copper Bottoms.

Polished Copper Bottoms and Flats, 1¢ ₩ lb. extra.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

List Feb. 20, 1903.

Nos.	0000 to 8 Base	9 and 10		11 and 12
		¼¢		½¢ ₩ lb. adv.
Nos.	13	14	15	16
	¼¢	⅝¢	1¢	1¼¢ ₩ lb. adv.
Nos.	17	18	19	20
	1¼¢	2¢	2½¢	2¾¢ ₩ lb. adv.

Seamless Brass Tubes—

Standard, always Stubs' gauge, unless otherwise ordered.

Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	.....	.....	13	31	27	25	25	27	25	25	25	24
12	10	.....	37	35	33	31	30	29	28	27	25	25	24
13	11	.....	37	35	33	31	30	29	28	27	25	25	24
14	12	41	37	35	33	31	30	29	28	27	25	25	24
15	13	42	39	39	33	32	31	30	30	28	26	25	25
16	14	43	39	37	34	33	32	31	30	29	26	25	25
17	15	44	41	38	35	34	33	32	31	30	27	26	
18	16	49	42	39	36	35	34	32	31	30	28	27	
19	17	50	47	44	42	37	36	35	34	33	32	29	
20	18-19	04	47	44	41	39	38	37	36	35	34	32	31
21	20	05	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	41	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ lb. additional.

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	29	27	21	21	21	21	21	21	21	23	23	25	27	28¢₩lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb. additional.

Brazed Brass Tubing.

(To No. 19, inclusive.) June 6, 1898.

Brown & Sharpe's gauge standard.

	Per lb.
Plain Round Tube, ¾ in. up to 2 in.	$0.35
" " " ⅝ " ⅝ "	.36
" " " ½ " ½ "	.38
" " " ⅜ " ⅜ "	.41
" " 5-16 " 5-16"	.48
" " ¼ " ¼ "	.65
" " 3-16 " 3-16"	1.00
" " ⅛ " ⅛ "	1.50
Smaller than ⅛ inch	Special
2 inch to 3 in. B. & S. 15, inclusive	.38
3 inch	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 25%

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

Common Eighteens	10.	12.	14.	16.	18.	20.	22.	24.
Wider than	2	12	14	16	18	20	22	24
and including	12	14	16	18	20	22	24	26
To No. 20 inclusive	.21	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos 27 and 28	.23	.25	.28	.30	.32	.34	.33	.39

Common High Brass.	1a.	1n.	1n	1n.	1n	1n	n.	1a 40
Wider than	26	28	30	32	34	36	38	
and including	28	30	32	34	36	38	40	
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.

Add ½¢ ₩ lb. additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 25%

Wire in Coils.

List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilt; bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28½
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 25%; Copper Wire, Nom. List November 16, 99.

Spring Wire, 2¢ ₩ lb. advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb., net	19¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb. net,	20¢

Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb.

Western Spelter	6@6¼¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.

No. 9, base, casks	7½¢
Open, per lb.	8¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American Pig	4¾@5¢
Bar	5¼@5¾¢
Pipe	6¾¢ ..... 20% off
Tin Lined Pipe	12½¢ ..... 20% off
Block Tin Pipe	40¢ net
Sheet Lead	7¾¢ ..... 20% off

Old Lead in exchange, 1¢ ₩ lb.

Solder.

½ & ½, guaranteed ..... 20 @20½¢

No. 1 ..... 17½@18¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson	8½@8¾¢
Hallett's	7¼@7½¢
U. S.	7 @7¼¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:	
Small lots	37¢
100-lb lots	35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:	
Small lots	34¢
100-lb lots	33¢

Aluminum Sheet, B. & S. gauge, 50 lb or more

	6-in.	14-in.	24-in.
Wider than	14-in.	24-in.	30-in.
And including	₩ lb.	₩ lb.	₩ lb.
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15	₩ lb 43¢
No. 9 to No. 10	₩ lb 40 ¢	No. 17	₩ lb 50¢
No. 11	₩ lb 41 ¢	No. 18	₩ lb 55¢
No 12	₩ lb 41½¢	No. 19	₩ lb 60¢
No. 13	₩ lb 42 ¢	No. 20	₩ lb 65¢
No 14	₩ lb 42½¢	No. 21	₩ lb 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 11¼¢
Light and Tinned Copper	₩ lb 10¾¢
Heavy Brass	₩ lb 8¼¢
Light Brass	₩ lb 6½¢
Lead	₩ lb 3½¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 4 ¢
No. 1 Pewter	₩ lb 18¢
No. 2 Pewter	₩ lb 8½¢
Pure Aluminum, Sheet, ₩ lb	21¢
Cast Aluminum, ₩ lb	16¢
Tin Plate scrap	₩ ton $4.50@5.00
Wrought Scrap Iron	₩ gross ton $14.50@15.00
Heavy Cast Scrap	₩ gross ton $14.00@14.50
Stove Plate Scrap	₩ gross ton $10.00@10.50
Burnt Iron	₩ gross ton $9.00@10.00